PAPER TRADE JOURNAL

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JUNE 20, 1940

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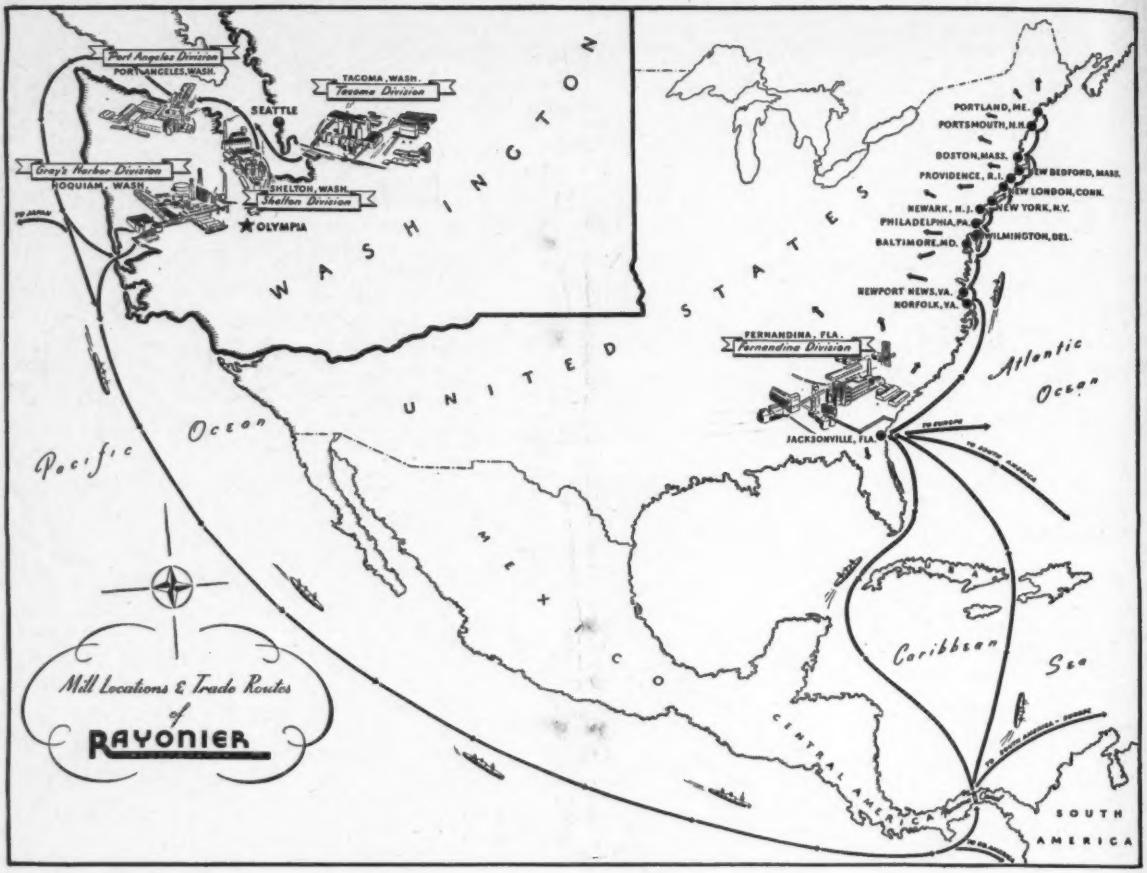

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Scott To Acquire Coos Bay Pulp Concern

Managers Authorized By Directors of Scott Paper Co. To Acquire Coos Bay Pulp Corp. Through Purchase of Entire Capital Stock Will Protect Raw Material Needs By Adding 22,000 Tons of Pulp.

Directors of the Scott Paper Company, have authorized the management to acquire the Coos Bay Pulp Corporation of Oregon through purchase of the entire capital stock, under an option obtained on April 27.

Thomas B. McCabe, president of Scott Paper, said this transaction would further protect the company's raw material requirements for 1941, since the Coos Bay company is a promoter of unbleached sulphite pulp with a rated annual capacity of 22,000 tons.

Net sales of Scott Paper for the five months to June 1 amounted to $7,996,283, a gain of $1,200,310, or 17.7 per cent, over the 1939 period, Mr. McCabe said. Production was at record levels.

Mr. McCabe outlined to stockholders various steps which the Scott Paper Company has been taking for several years with the view to developing domestic sources for the type of pulp used in the company's operations. "To this end we have proceeded along three definite lines. In conjunction with the Mead Corporation we have built and expanded the plant of the Brunswick Pulp and Paper Company. Plans have been made to acquire an unbleached sulphite pulp mill on the west coast and the Scott research staff has for the last two years been working in cooperation with a number of pulp mills in the United States and Canada. As a result the company has available satisfactory domestic and Canadian sources of pulp supply and has contracted for a large tonnage of high quality pulp.

Acquires Bennett License

The American Cyanamid and Chemical Corporation, 30 Rockefeller Plaza, New York has sent out the following announcement which is self explanatory: "As a step to supplement our line of paper sizes we take pleasure in announcing that we have acquired an exclusive license under all Bennett, Inc. patents, subject to existing outstanding licenses, together with that part of the Bennett, Inc. business relating to the manufacture and sale of wax-rosin size, all wax size, and liquid rosin size to the paper trade, paper board trade, and related industries.

"It will be our endeavor to make this development in our program of expansion of the fullest benefit to our customers. The same technical service offered to the Paper Industry in the past by both organizations will be supported by the research facilities of our extensive laboratories at Stamford, Conn.

The manufacture of sizes mentioned above will be continued for the present at the Lawrence, Mass. plant of Bennett, Inc. until provision for the production of these products can be made at our new Kalamazoo, Mich. size plant and at other existing plants of our Company servicing paper manufacturing centers.

"Our staff of paper size specialists has been augmented by several former members of the Bennett organization. Charles J. Prescott, Jr. and Ralph W. Kumler will be located at our New York office; Harold Sinclair will be attached to our Kalamazoo Office; Florian A. Strovink to our Boston Office and Chester C. Irving to our Charlotte, N. C. Office. Rotheus B. Porter, Jr. and Mr. Walter Thomas will join the Cyanamid Research Staff at Stamford.

May Newsprint Statistics

Production of newsprint in Canada during May 1940 amounted to 323,563 tons and shipments to 334,441 tons, according to the News Print Service Bureau. Production in the United States was 90,207 tons and shipments 88,912 tons, making a total United States and Canadian news print production of 413,770 tons and shipments of 423,353 tons. During May, 31,033 tons of newsprint were made in Newfoundland, so that the total North American production for the month amounted to 444,803 tons. Total production in May 1939 was 358,185 tons.

The Canadian mills produced 226,125 tons more in the first five months of 1940 than in the first five months of 1939, which was an increase of twenty and five tenth percent. The output in the United States was 35,882 tons or nine and two tenths percent more than in the first five months of 1939, in Newfoundland production was 24,595 tons or twenty-one and four tenths percent more, making a total increase of 286,602 tons, or seventeen and eight tenths percent more than in the first five months of 1939.

Stocks of news print paper at the end of May were 203,672 tons at Canadian mills and 17,975 tons at United States mills, making a combined total of 221,647 tons compared with 231,230 tons on April 30, 1940, and 209,374 tons at the end of May 1939.

Lewis Read Appointed to Manage Two Mills

Succeeding the Late F. W. Motscham, Lewis H. Read Becomes Manager of Southern Kraft Mills At Marinette and Menominee — Honorary Degree Conferred On C. W. Boyce By Lawrence College—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., June 17, 1940—Lewis H. Read has been appointed manager of the Southern Kraft Corporation's mills at Marinette, Wis., and Menominee, Mich. He succeeds the late F. W. Motscham, who passed away recently while recuperating from ill health in Florida.

Mr. Read was transferred from the corporation's mill at York Haven, Pa., where he has been manager for the last four and a half years. Prior to that time, he was technical director for three years for the Escanaba Paper Company. Mr. Read and his family have arrived at Marinette, Wis. to reside, and he has already assumed his new duties.

Lawrence College Honors Charles W. Boyce

An honorary degree of doctor of laws was conferred on Charles W. Boyce at the commencement

DR. BARROWS CONFERS DEGREE ON DR. BOYCE.

exercises of Lawrence College, Appleton, Wis., June 10. Mr. Boyce was executive secretary of the American Pulp and Paper Association for ten years, and is now vice-president of the Northwest Paper Company, Cloquet, Minn.

In conferring the degree, Dr. Thomas N. Barrows, president of the college and director of the Institute of Paper Chemistry, said: "In an era that has shaken most institutions and concepts, as the executive officer of one of the oldest and most significant trade associations, you have worked with calmness and intelligence; with a profound grasp of objectives and with a capacity for introspection that have given breadth and substance to industrial statemanship. Your sound reflections on the fundamentals of an important industry have educated and stimulated others, and you have demonstrated through democratic and parliamentary procedures, the efficacy of industrial cooperation and collective wisdom."

At the annual meeting of the board of trustees of the college, Roy H. Purdy, president and general manager of the Tuttle Press, paper converters, Appleton, Wis., was elected a member of the board. He is also vice-president and secretary of the Appleton Wire Works, Appleton, Wis., and is a past president of Appleton Chamber of Commerce. George Banta, Jr., vice-president of the Banta Publishing Company, Menasha, Wis., was elected president of the board to succeed C. B. Clark of Neenah, Wis., president of the Riverside Paper Corporation of Appleton.

Water Ample in Wisconsin River

Water power for operation of mills along the Wisconsin River will be adequate for the summer season as the result of heavy rains during the last few weeks. The Wisconsin Valley Improvement Company, operating a system of control dams and reservoirs for the mills, reports that all reservoirs are now filled to capacity. Recent storms caused flood conditions, and it was necessary to open a number of sluice gates to release surplus water. None of the mills appeared to be affected by the flooding, however, and welcome a surplus of water for the customary drought period during the summer, when auxiliary power usually is necessary.

Ward Wheeler Forms Company

Ward Wheeler, formerly associated with Appleton Machine Company, Appleton, Wis., has organized the Wheeler Roll Company, to be located at Kalamazoo, Mich. The plant is being equipped for the exclusive manufacture of calender rolls. His brother, Grant Wheeler, will be associated with him in the new business.

Nuptials in Paper Industry

Among the weddings of the last week was that of John Paul Strange, Jr., Menasha, Wis., and Miss Gretchen Caley of Menominee, Mich., which was solemnized Saturday evening, June 15, at St. John's Catholic church, Menominee. Mr. Strange is a son of Paul Strange, vice-president of the John Strange Paper Company, Menasha, Wis. He is associated with his father in the John Strange Pail Company.

Raymond E. Baker, who received his doctor of philosophy degree at Lawrence College, Appleton, Wis., June 10, after completing his studies at the Institute of Paper Chemistry, was married June 8 at Ironwood, Mich., to Miss Jane Elizabeth Lesselyong of that city. Dr. Baker received his B. A. degree at De Pauw University, Greencastle, Ind., in 1935, and his M. S. degree at Lawrence College in 1937. The couple will reside at Berlin, N. H., where Dr. Baker is employed.

Lambert Van Roy, chemist at the Lakeview mill of Kimberly-Clark Corporation, Neenah, Wis., and Miss Elizabeth Welhouse of Appleton, Wis., were married June 10 at St. Joseph's church at Appleton. After a week's trip, the couple will reside at a cottage at Lake Winnebago.

John Doerfler, paper tester for Kimberly-Clark Corporation at its mill at Kimberly, Wis., and Miss Jane Kilpatrick of Kimberly, were married June 6

(Continued on page 36)

Luncheon Is Tendered to Ambrose H. White

Friends and Associates Say Au Revoir To Former Vice-President and Chief Engineer of International Paper Co. At Luncheon At Murray Hill Hotel—Is Presented Gold Watch—Review of Mr. White's Long Career.

Friends and former associates of Ambrose H. White, formerly vice-president and chief engineer of International Paper Company, gathered for a testimonial luncheon in his honor at the Murray Hill Hotel on Monday, June 17, to say au revoir to Mr. White who is leaving his old home in Bronxville, N. Y., to return to his native state of Maine. Although Mr. White is severing active connection with International, he is still on call whenever his services as an expert engineer may be required.

A Noteworthy Career

Mr. White's career has been a noteworthy one. Born at Bucksport, Me., in 1868, he started his business career with a party of engineers surveying the route of what is now the Canadian Pacific Railway across the state of Maine. Later he was employed in Bangor, Me., by a sawmill, a foundry, and a machine company.

In 1886 he entered the Maine State College of Agriculture and the Mechanic Arts (now the University of Maine at Orono) as a sophomore. During vacations he worked on railroad surveys. He left college in the spring of 1888 to become assistant to the engineer building the Lime Rock Railroad at Rockland, Me. In 1888 he was employed as draftsman by the Trenton Iron Company of Trenton, N. J., and later by the Thomason-Houston Company (now General Electric) at Lynn, Mass. He then went to the John A. Roebling Company as engineer on aerial tramways; and to the Otis Elevator Company as a draftsman.

With A. B. Tower in 1893

1893 found him in the employ of A. B. Tower at Holyoke, Mass. George F. Hardy was then a partner in that firm. Mr. White left during this "depression" year and took a position as a division engineer of the Massachusetts Metropolitan Sewer Commission. In 1894 he was assistant city engineer at Everett, Mass. In January, 1895, he was recommended by Tower & Co. to supervise the erection of what is now the pulp mill of International Paper Company at Webster, Me. In 1896 he supervised the erection of the first paper mill unit at South Brewer, Me., and immediately thereafter he supervised the building of a large stove foundry.

Joined International in 1898

It was in May, 1898, that he joined International Paper Company, then in formation, and was placed in charge of the drafting room. Subsequently he was made division engineer at Watertown, N. Y. On October 1, 1900, Mr. White was called back to New York by International to succeed George F. Hardy, who had bought the business left by Mr. Tower.

Mr. White's career since 1900 has been one of constant progress and it was under his supervision that many of the New England, New York, and Canadian paper and power plants of International were built or rebuilt. Among the more important developments in which Mr. White was actively interested were the building of the Aziscohos Dam on the Androscoggin River; a pulp mill and machine room at the Otis Mill; the hydro-electric plant at Sherman Island on the Hudson; new dams at Corinth, N. Y., Glens Falls, N. Y., and Orono, Me.; oil burning apparatus at the Otis and Rumford mills; a ferro-silicon plant at Niagara Falls and, in more recent years, additions to the Three Rivers newsprint mill in Canada and the installation of powdered coal apparatus; the building of the Gatineau and Dalhousie mills, together with general supervision of the design and construction of the Paugan, Chelsea, and Farmers hydro-electric plants on the Gatineau River; as well as supervising construction of the hydro-electric plant at Grand Falls, New Brunswick.

In 1908 Mr. White was appointed chief engineer of International, and in 1927 he was elected a vice-president, serving in that capacity until 1931.

Old Friends Present

The following old friends of Mr. White in International, including a number of his old associates in the Company, attended the luncheon: H. J. Farrell, A. P. Forsberg, J. J. Craig, Herbert Weaver, J. Parody, A. E. Strauch, Edward Hutchins, F. T. Harris, B. O. Booth, W. S. Housman, Earle Weaver, C. T. McGreen, P. V. Hollenback, R. I. LaMarche, P. R. Browne, E. S. Booth, J. J. Andrews, G. S. Ferris, H. R. Weaver, M. T. Lee, Edward Reese, O. E. Karnof, F. A. Auffermann, Jr., J. L. Fearing, H. F. LaMarche, H. E. Shepherd, A. K. Smith, G. Meerbergen, S. E. Kay, Edward Bebie and I. L. Moore.

Edward Hutchins Presents Watch

At the conclusion of the luncheon, Edward Hutchins, Mr. White's assistant in his engineering work for many years, made the presentation speech in which he praised Mr. White for his long and successful career and for his never-failing spirit of helpfulness to all those who worked with him. Mr. Hutchins concluded his speech by presenting Mr. White with a gold watch, suitably inscribed, together with a bag containing a barrel of hard money, golf balls and golf tees.

Detroit Sulphite Announces Winner

The winner of the Cordova Idea File Contest in the St. Louis area, as announced by Kenneth G. Sell, Sales Manager of the Detroit Sulphite Pulp and Paper Company, was Ben Wiley of the Frye Printing Company of Springfield, Ill. Mr. Wiley's design was a suggestion for a cover for a lumber company's catalog on lawn seats. While handled simply, the type faces were very well selected, and an interesting use of parallel rules, giving the effect of typical lawn seat construction, forms a panel for the title.

The Frye Printing Company also receives the order for printing copies of the prize-winning design which will be distributed to printers throughout the country for insertion in their Cordova Idea Files.

Chicago Paper Market Strong and Higher

Spot Prices On Uncoated Book Paper Move Upward and Groundwood Papers Expected To Advance $5 Per Ton — Salesmen To Hold Second Golf Outing—Paper Merchants Observe Five-Day Week—Trade News.

CHICAGO, Ill., June 17, 1940—With uncoated book papers moving into new high ground this week, the Chicago paper market virtually rounded out its immediate reaction to the confusing European situation. Book papers, the last to move, were reported to have increased a minimum of $7 in the uncoated grades though coated grades are indicated as retaining their present unchanged position. Local offices also indicate that groundwoods, will probably turn upwards to the extent of $5 before the week is out. Bonds reflected the shortages last week and, of course, krafts have been experiencing the excitement of a "boom" situation for some time. The book changes were reported as on spot business only.

Local Demand Holding Up Well

Local offices also reported the demand was holding up well and that response to the higher ranges of prices indicated that buyers were well versed in the actual production scale and in the shortage of pulp which necessitated drastic upward revisions. Waste papers were steady to strong during the week though in certain of the better grades the market was running far stronger with indications that more upward revision would be made on the July 1 announcements.

Salesmen To Hold Golf Outing

"Pat" Patterson, Flambeau Paper Company executive who has charge of the golf activities of the Salesmens Association of the Paper Industry, western division, has sent out the call for the second of the series of monthly golf outings. The June event is to be held next Friday, June 21, at the Park Ridge Country Club. Approximately 70 salesmen and guests are expected to be present for lunch, golf and dinner.

Paper Executives Form Partnership

Two well known Chicago paper eexcutives, C. E. Atwood and K. J. Kortzenborn, have recently formed a partnership with headquarters at 711 West Randolph street. According to reports, the Atwood Paper Company will be utilized to handle only mill shipments while the Kenny Paper Company is scheduled to materially enlarge its selection of fine papers for sale in the local market.

Chicago Firms to Exhibit at Convention

Many of Chicago's leading industrial concerns will be in Cincinnati next week presenting their wares to those in attendance at the twenty-first annual convention of the American Pulp and Paper Mills Superintendents Association. The meeting, scheduled for June 18 to 20, will be held at the Netherlands Plaza Hotel.

Included in the group of exhibitors are the following:

Acme Steel Company with exhibits of Steel-Strap and Unit-Load Processes both well known in the field of paper production and executives will be on hand to discuss the packing and loading problems of the industry.

Barco Manufacturing Company, with exhibits of Barco joints together with literature on Barco revolving type flexible ball joints.

Link-Belt Company, with comprehensive and illustrated display of belts and conveyors designed to be especially suited to a solution of the problems of the paper manufacturing industry.

Paper Merchants on Five-Day Week

Chicago fine paper distributors have no reason to revise their work week because of the summer season. Most of them have been keeping open on a five day week basis throughout the entire year and will thus have no rearrangements to make to conform to the "Saturday closing" program which has been a feature of other years. Incidentally, those interviewed on the matter continued to state that the five day business week has proven satisfactory to the trade in general as well as to workers in the many cooperating companies.

Greggory Adds Embossing Equipment

A 96-inch flute embossing machine has been added to the equipment of Greggory, Inc., Chicago firm with offices at 8 East Kinzie street. The machine produces a recessed effect in all weights of boards. The fabrics concern has also added an automatic roller coating system for blocking the surfaces of paper and board with any pulverized material of proper size.

Paper Men at Freight Association Banquet

Several executives representing the paper industry in Chicago attended the tenth annual banquet of the Central Motor Freight Association held in Chicago last week and heard Director of Public Works C. P. Casey tell the audience that motor carriers of Illinois will find the new state truck act a constructive step in their regulation. The state truck act, he said, makes the operations of many carriers legal for the first time and will bring greater safety to the public. Alex K. Scherer of Ottawa, was elected president of the Association.

Lawrence Killam Returns To Coast

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., June 17, 1940—Lawrence Killam, president of the British Columbia Pulp and Paper Company, is now back on the coast after a business visit to Eastern Canada. He stated that his company's plants at Woodfibre and Port Alice, B. C., were working to capacity, that the entire output of both plants for the current year was contracted for in the latter part of 1939.

Mr. Killam stated that at the present time all pulp and paper producers throughout Canada as well as up and down the Pacific Coast were operating plants to capacity. His own company was mainly exporting to England, United States and Japan, he stated.

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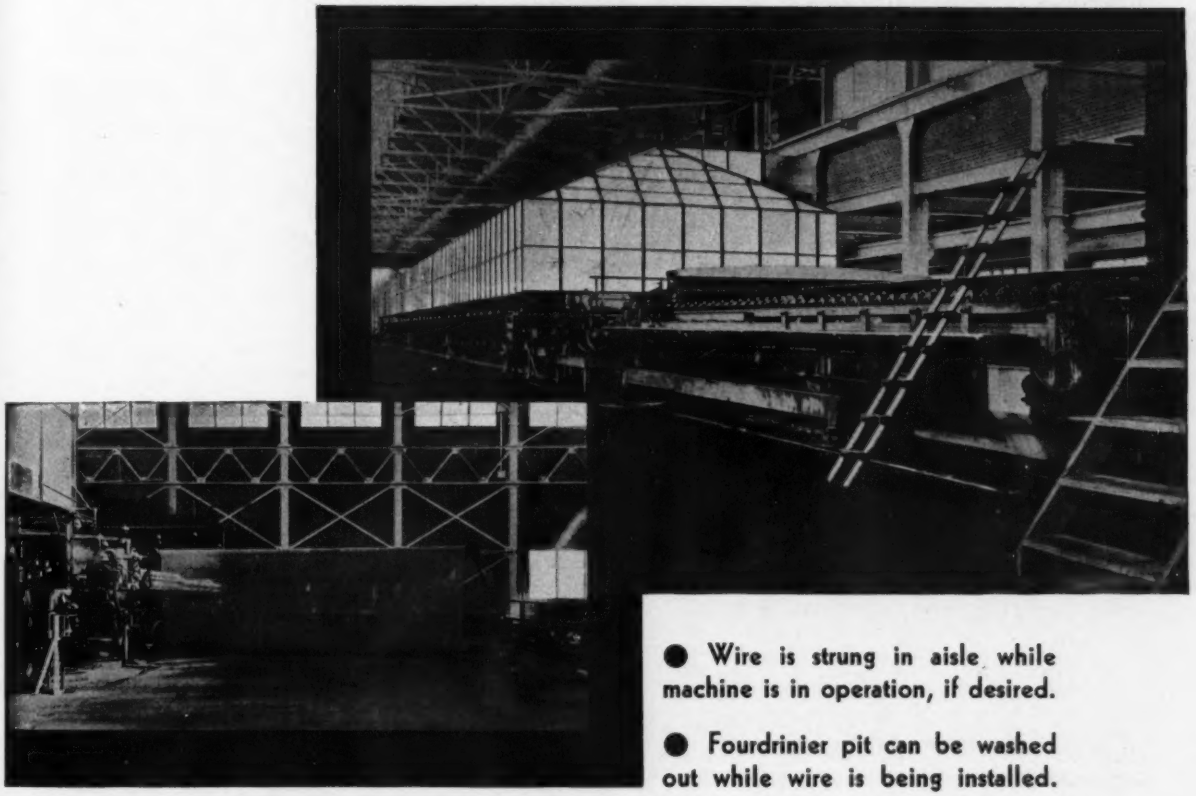

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Boston Paper Men Hold Meeting and Outing

One Hundred and Ten Persons Attend Regular June Meeting and Outing of Boston Paper Trade Association — List of Winners In Golf and Other Contests — Fine Paper Men Meet — Harben Products Chartered.

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., June 17, 1940—With an attendance ance of 110, in spite of the rainy weather, the regular June meeting and outing of the Boston Paper Trade Association was a highly enjoyable affair held June 10, as for a number of years, at the Charles River Country Club, Newton Centre, Mass.

Many members and guests who played golf came early to be out on the links all day and were joined by others up to 2 o'clock. On account of the rain, the other outdoor sports were cancelled, but those who would have participated in them played auction bridge, the winners receiving prizes which had been designated for the leaders in the sports.

Luncheon was served in the Locker Building from 11:30 on, and dinner in the evening. At the conclusion of the dinner, held at the club house, a feature was the singing of "America" and "The Star Spangled Banner," with a large national emblem brought into the room.

Vice-president Brewer Presided

In the business meeting after the banquet, Second Vice-President John H. Brewer presided in the absence of President Robert M. Stone, and also that of First Vice-President Irving N. Ensleeck.

It was voted to send John E. A. Hussey, who was ill, a letter, wishing him well.

John Vivian was complimented as doing an outstanding job on the arrangements committee.

Applications of New Members Received

Seven applications for membership were received: S. E. Lewis, E. J. Dowd, N. L. Rhoades, Joseph Starr, Fred Hergesheimer, L. C. Bills and L. R. Mathers.

Winners in Golf and Other Contests

Gorham Bliss won the handsome silver Golf Championship Cup, offered by the Boston Paper Trade Association for first net in Class A. The winner keeps the cup for a year, but it is not perfantly won until one player has attained first net three times. Mr. Bliss makes the fifteenth man to capture the cup temporarily. Four have won it twice.

Other Class A winners were: 1st gross, Dan Abercrombie; 2nd net, J. H. Sweet; 3rd net, Bruce Crane; 4th net, Fred T. Burkhardt. Class B, 1st gross, Maurice A. Parks; 1st net, Adna C. Denison; 2nd net, S. Collins; 3rd net, Ralph Day; 4th net, Carl Knutson. Best selected nine, Jack Whitney. Guest prize, 1st net, W. K. Bruckhauser; 2nd net, H. B. Simmons; 3rd net, Bob O'Neil. Kickers, Frank B. Cummings and Ernest C. Calkin.

The golf committee was composed of W. J. McLellan, chairman, Nelson Feeley, Floyd H. Blackman, P. Richardson and W. Edwin Porter, Jr.

Winners at auction bridge were F. H. Masselink, F. D. Bennett, Stephen E. Lewis, N. S. Clark, David Cheever and W. T. Libby. F. O. Johnson received the consolation prize.

The bridge committee was the same as that originally chosen for the outdoor sports committee, A. T. Carter, chairman, Hubert Lockhart, F. W. Masselink, P. M. Beach and David Cheever.

Ten attendance prizes were awarded, with Frederic T. Main, blindfolded, drawing the names.

Fine Paper Men Meet

A meeting of the Fine Paper Division of the New England Paper Merchants Association was held Tuesday, June 11, at the Boston Chamber of Commerce, at which all members agreed to close June 17. Vice-President Frederick G. Lockwood presided.

The Wrapping Paper Division also closes the same day.

Harben Paper Products Formed

The Harben Paper Products, Inc., Cambridge, Mass., has been incorporated. The incorporators are Benjamin Kaplan, Joseph D. Caimi and Harry J. Dowd.

Arthur E. Cabble Dead

Arthur E. Cabble, sales manager of the William Cabble Excelsior Wire Manufacturing Company, 80 Ainslie street, Brooklyn, N. Y., died Thursday morning, June 13, at his home in Garden City, L. I. Mr. Cabble was aged 54 years. He was born and educated in Brooklyn. On the completion of his education at Brooklyn Boy's High School, he became connected with the William Cabble Excelsior Wire Manufacturing Company and in the course of time was made secretary and later became president. Owing to ill health, however, he resigned the presidency about eight years ago, but continued as sales manager. He was connected with the company for 35 years and was very well known in the paper industry in New England, New York and the Middle West. He was also a trustee of the Bushwick Savings Bank of Brooklyn.

Surviving are his widow, Grace Robinson Cabble, and his son Egbert A. Cabble. The funeral services were held Sunday morning and the interment was Cypress Hills Cemetery.

Berkshire Paper Corp. Incorporates

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., June 17, 1940—Articles of incorporation have been filed with the Indiana secretary of state by the Berkshire Paper Corporation, 5231 Hohman avenue, Hammond, Ind., formed to deal in paper and paper products, and twine and other allied materials. The corporation has 100 shares of no par value capital stock and the incorporators are Hamilton Vose Jr., Perry McGillivray and Samuel Wulfsohn.

CONSTRUCTION NEWS

Niagara Falls, N. Y.—The Kimberly-Clark Corporation, Neenah, Wis., has plans under way for new addition to branch mill on Packard road, Niagara Falls, used for the production of book and other paper stocks. It will be one-story, reported to cost over $60,000, with equipment. Work is scheduled to begin soon.

Mount Vernon, Ohio—The Shellmar Products Company, Mount Vernon, manufacturer of cellophane products, has plans maturing for new addition to local plant for large increased capacity in converting department, to be two-story, about 125 x 200 feet. A smaller structure will be erected, one-story, 21 x 80 feet, for accessory service, as well as a one-story addition to administration building. Entire project will cost over $150,000 with equipment. Proposed to begin work in near future. Main office of company is at 224 South Michigan avenue, Chicago, Ill.

Johnsonburg, Pa.—The Castanea Paper Company, manufacturer of book and other paper stocks, plans construction of a dam across West Branch of the Clarion River, in borough limits, for increased water supply for mill. Permission has been granted by State Water and Power Resources Board, and work will be placed under way soon. This is part of expansion and improvement program at mill, recently referred to in these columns, including modernization in different divisions. Cost reported over $50,000, including equipment. T. K. Hendryx, 165 Interstate parkway, Bradford, Pa., is architect and engineer.

Hempstead, Tex.—The Texas Gypsum Mining and Construction Company, recently organized, care of D. S. Culberson, Hempstead, one of incorporators and officials of company, has preliminary plans under way for construction of new mill in vicinity of Hempstead, for the manufacture of fiber board and wall board products under a new manufacturing process. A site is being secured and actual construction will begin in near future. Mill will consist of a large one-story structure and several smaller one-story buildings for storage, distribution and other operating service. It will be equipped for an initial capacity of about 100 tons of fiber board products per day, and is estimated to cost approximately $200,000, of which more than one-half will be expended for machinery and equipment. A boiler house and pumping station will be erected for mill service. Bagasse or sugar cane waste will be used as a filler in the manufacture of company product, and source of supply of such material is being arranged in Louisiana. A tract of about 7500 acres of gypsum properties near Hempstead has been secured under lease, and a complete mining plant will be installed for raw material supply for mill; two mining shafts will be sunk at early date and machinery installed for large output, all of which will be electrically-operated. This part of project is estimated to cost about $100,000, including machinery. Charles A. Howe, Dayton, Ohio, will be president of the company.

Betzwood, Pa.—The Taylor Fibre Company, Provident Trust Building, Philadelphia, Pa., manufacturer of fiber products, has approved plans for new addition to mill at Betzwood, near Norristown, Pa., consisting of a one-story structure, reported to cost over $40,000, including equipment. General erection contract has been awarded to Frank R. Heavner, Montgomery Trust Building, Norristown, and work will be placed under way at once.

Laurel, Miss.—The Masonite Corporation, manufacturer of insulating board and other pressed wood board specialties, is said to have preliminary plans for new local byproducts plant unit, to be used for the production of furfural, formic and acids under a new recovery process from the wood used for main manufacture. New plant will be designed for commercial production and will be operated in conjunction with pressed wood mill.

Atlanta, Ga.—Montag Brothers, Inc., 182 Marietta street, N. W., paper products, has plans under way for new addition to plant, consisting of a three-story structure to provide for large increase in converting, storage and distributing departments. It is reported to cost over $45,000, with equipment. Bids are scheduled to be asked soon on general erection contract. Robert & Company, Bona Allen Building, are architects and engineers.

Corning, N. Y.—The Corning Fibre Box Corporation, Hammel street, manufacturer of corrugated boxes and containers, has begun erection of proposed new addition to plant, previously referred to in these columns, and will push work to early completion. New structure will be one-story, reported to cost close to $50,000, and will be equipped for increased capacity. Erection is being carried out by the Henry W. Streeter Corporation, 608 William street, Elmira, N. Y., general contractor. A. M. Tietzel, Market street, Corning, is engineer.

Elizabeth, La.—The Calcasieu Sulphate Paper Company, Inc., has approved plans for construction of a pressure pipe line from natural gas wells at North Eltor, Allen Parish, La., to mill site, to be used for gas transmission for power house service at plant. Award for pipe line installation has been made to the Latex Construction Company, Alexandria, La., and work is scheduled to be placed under way at once.

Brantford, Ont.—The Sonoco Products Company of Canada, Ltd., Park avenue East, manufacturer of paper tubing, cones, etc., has awarded general contract to the Cromar Construction Company, 446 Colborne street, Brantford, for new addition to plant, to be three-story and basement, 40 x 120 feet, estimated to cost over $85,000, with equipment. Work is scheduled to be placed under way at once. Company is a Canadian subsidiary of the Sonoco Products Company, Hartsville, S. C.

Drummondville, Que.—Canadian Celanese, Ltd., 1401 McGill College avenue, Montreal, Que., manufacturer of cellulose rayon products, has plans maturing for large addition to mill at Drummondville, consisting of several one and multi-story units, to be equipped for extensive increase in present output. Cost estimated close to $1,200,000, with machinery. Work is scheduled to begin at early date. C. E. Olive is company engineer, in charge.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending June 19, 1940

	High	Low	Last
A. P. W.	2¼	1¾	2¼
Armstrong Cork Co.	29¾	25¼	29¾
Celotex Corp.	6⅞	5½	6⅞
Celotex Corp., pf.	49	48	49
Certain-Teed Products Corp.	4½	3⅞	4½
Certain-Teed Products Corp., pf.	21	17½	21
Champion Paper & Fibre Co.	22	20½	20½
Congoleum-Nairn Co.	16	15	15¼
Container Corp. of America	13	12	12¾
Continental-Diamond Fibre Co.	6½	5⅜	6½
Crown-Zellerbach Co.	14¾	12⅞	14½
Crown-Zellerbach Co., pf.	81¼	79	81¼
Flintkote Co.	12⅞	11¾	12⅞
Robert Gair	3	2⅞	2½
Robert Gair, pf.	12½	12½	12½
International Paper & Power	13⅞	11⅝	12¾
International Paper & Power, pf.	50½	45¼	48⅝
Johns-Manville Corp.	53	48½	52
Johns-Manville Corp., pf.	125	123¼	125
Kimberly Clark Corp.	35½	32½	35½
MacAndrews & Forbes	26¼	26¼	26¼
Masonite Corp.	24½	22	23½
Mead Corp.	9⅜	9	9⅜
Paraffine Companies, Inc.	30	28½	29½
Rayonier, Inc.	18	15¾	17½
Rayonier, Inc., pf.	29	26½	26½
Ruberoid Co.	13½	13	13½
Scott Paper Co.	37⅜	35⅜	37⅜
Scott Paper Co., pf.	108¼	108¼	108¼
Sutherland Paper Co.	22½	22¼	22¼
Union Bag & Paper Corp.	12⅝	10¼	11½
United Paperboard Co.	3⅞	3½	3¾
U. S. Gypsum Co.	56¼	52¾	54
U. S. Gypsum Co., pf.	170	167	170

New York Curb Exchange

High, Low and Last for Week Ending June 19, 1940

	High	Low	Last
American Box Board Co.	4½	4⅛	4½
Brown Co., pf.	20	17	17
Great Northern Paper	40	40	40
National Container Corp.	10½	10	10
St. Regis Paper Co.	2⅞	2⅜	2⅝
St. Regis Paper Co., pf.	59⅞	55	59¼
Taggart Corp.	3⅛	3	3

Mercey Paper Nets $437,781

MONTREAL, Que., June 17, 1940—The report of the Mercey Paper Company, of Liverpool, N. S., for the year ended December 31, 1939, shows net profit of $437,781, after interest, depletion, depreciation, income taxes provision, and $27,990 proration of bond discount and expense written off, equal after preferred dividend requirements to $1.08 a share on 150,000 no par common shares.

This compares with profit of $453,078, after interest and depletion for the previous year, all of which was transferred to depreciation.

Balance sheet shows current assets of $2,847,352 and current liabilities of $994,729, compared with current assets of $2,651,095 and current liabilities of $1,194,169 at the preceding year-end.

Funded debt was reduced to $1,995,500 from $2,049,500 at December 31, 1938. Net profit was transferred to consolidated surplus account which amounted to $437,781 at December 31, 1939, since no preferred dividends were paid during the year and no balance remained at the previous year-end.

Soundview Profits Up

The Soundview Pulp Company for five months to May 31 reports a net income of $954,977, equal to $1.84 a common share, compared with $106,862, or 11 cents a share, for the corresponding period last year.

Canadian Pulp Prices Advance

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., June 17, 1940—Announcement has just been made by major producers of an advance of $11.00 per ton in price of unbleached sulphite pulp for third quarter delivery to regular contract customers. Soda pulp price also for third quarter delivery to regular contract customers is increased $8.00 per ton.

Price of unbleached sulphite pulp is increased to $63.50 from $52.50 per air dry ton of 2,000 lbs. based on United States Atlantic seaboard ports. Previous advance this year was $2.50 per ton for second quarter, prior to which price level for most of 1939 of $40.50 was increased $10.00 to $50.00 per ton for first quarter of 1940.

Price of soda pulp delivered to United States user's mill is increased to $66.00 from $58.00 per air dry ton of 2,000 lbs.

To Erect Pulp Mill in Asturias

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 19, 1940—It is reported from Oviedo that the Government's Ministry of Industry and Commerce has authorized the erection and operation of a new wood pulp and tannic extract plant which is to be located in the Town of Grado, Asturias, according to a recent report from the office of the American Commercial Attache, Madrid. The new property has been allocated an area of some 45,000 square meters of timberland, valued at 4,000,000 pesetas, from which raw materials will be drawn. It is stated that the new plant is expected to begin operations in the very near future.

Johns-Manville Officials Appointed

Election of L. M. Cassidy and L. C. Hart as vice presidents has been announced by L. R. Hoff, president of the Johns-Manville Sales Corporation. Mr. Cassidy was also appointed general manager of the building materials department of the company and a member of the officers board. In addition to his new duties Mr. Hart will continue as general sales manager of the building materials department.

The reorganization was effected, Mr. Hoff said, to fill the vacancy caused by the recent death of P. A. Adrews, vice president in charge of the building materials department.

Oregon Pulp Loses $21,816

The Oregon Pulp and Paper Company for 1939 report a deficit of $21,816, compared with one of $84,922 the year before.

Bowater's Earns $341,696

Bowater's Newfoundland Pulp and Paper Mills, Limited for 1939 reports a net income of $341,696, against net loss in 1938 of $482,819.

Expand Gair Philadelphia Plant

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., June 17, 1940—The Robert Gair Company's Philadelphia corrugated box plant, at Rhawn and Tacony streets, now being reconditioned and enlarged, will be in operation about July 15. In addition to the 44,000 square feet of manufacturing space in the building, formerly occupied by Canada Dry, the Gair Company has erected an extension of approximately 22,500 square feet, which will be used largely for roll stock storage, thus assuring an ample supply of material. When in full operation, this plant will employ upward of one hundred men. Also, inasmuch as the property includes about four acres of land there is ample opportunity for expansion. The plant has a railroad siding on the Pennsylvania Railroad main line near the Holmesburg Junction Station.

In the interest of service to customers in the Middle Atlantic States, and especially in the vicinity of Philadelphia, there is being installed in these buildings complete equipment for the manufacture of corrugated shipping cases, floor display stands, and other corrugated products. The most modern equipment and manufacturing methods will ensure economy in manufacture.

Special emphasis will be placed on fine color printing, today a necessity in the shipping container field which recognizes the value of carrying advertising throughout every phase of packaging. Although most of the packing problems will be solved by the staff at the Philadelphia Branch, the general research and creative art services of the Gair Company will be available. These include expert designing, both art and structure, research, building of special cases to individual needs, surveys and possible simplification of customers' requirements, full information on railroad specifications and requirements, etc.

Harry J. McPhilliamy, now manager of New York City Container Sales, and formerly manager of the Thames River Plant at New London, will be the resident manager of the Philadelphia plant, and Joseph Murphy will have charge of manufacturing.

The Gair Company is one of the largest and oldest in the shipping container field as well as in the manufacture of folding paper cartons, paperboard, solid fiber containers, etc. The company operates plants in Piermont, Brooklyn, Tonawanda, Syracuse, and Utica, N. Y., Bogota, N. J., Haverhill, Newton Upper Falls and Holyoke, Mass., New London, Conn., and Cleveland, Ohio, as well as numerous factories in Canada. The New London plant will be replaced shortly by the Philadelphia and Portland, Conn., plants, which are more favorably situated for service to customers. A Philadelphia Sales Office, with E. E. Seaver as manager, has been operated for more than forty years.

Install Corrugating Machine

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., June 17, 1940—Work has been started on installation of a large corrugating machine at the Anderson, Ind., plant of the Container Corporation of America. After completion of the installation the production at the plant will be stepped up considerably. Officials of the company say orders are plentiful at the plant and it is working at capacity.

A brilliantly WHITE, pure titanium dioxide possessing excellent . . .

• OPACITY

• BRIGHTNESS

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Suitable for ALL types of paper ranging from thin printing papers and waxing tissues to coated book and magazine stocks.

UNITANE O—110 was especially developed for paper pigmentation. Its excellent dispersion in water promotes good retention and excellent sheet formation. As a component of the beater furnish, it produces *whiter* sheets of *great brilliance*, and superior printing qualities.

SAMPLES of UNITANE O-110 will be sent promptly upon request.

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NEWARK, NEW JERSEY

SALES OFFICES IN PRINCIPAL CITIES

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Vol. 110 June 20, 1940 No. 25

COMING EVENTS IN PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Olympic Hotel, Seattle, Wash., August 20-23.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, Annual Convention, Netherland Plaza Hotel, Cincinnati, Ohio. June 18-20.

NATIONAL SAFETY COUNCIL, PAPER AND PULP SECTION, Annual Meeting, Stevens Hotel, Chicago, Ill. October 7-11.

NATIONAL DEFENSE AND INDUSTRY

With industry and trade activity nearly seven per cent higher than last year, business is expected to continue its advance for some time under the stimulating effect of the large national defense program. "National security," says the *Washington Review*, published by the Chamber of Commerce of the United States, "is of first importance. It must be made adequate to protect the country from any aggression, and kept adequate, in trained men and in equipment, by sea, by land and by air. There must be such plans for industrial mobilization that the country's economic strength may be swung behind any belligerent effort forced upon us. Within the short period of three weeks there have now been brought forward, and started quickly toward enactment, provisions for additional expenditures for national defense during the next twelve months to a total of at least $1,266,000,000 over and above the $1,800,000,000 earlier contemplated. That means a total above $3,000,000,000 or approximately twice the expenditures of the year that ends with the current month."

In commenting on the capacity of industry to meet the national defense program the *Washington Review* states in part: "Those who are responsibly engaged in industry know capacity, know possible adjustments for the concentrations of effort that may be needed, and know the processes of production that will give the best results. If they are given specifications and time schedules, they will proceed without economic disturbances,—without the interposition of the "different world" already apparently intimated in some official quarters,—and without the need of government-owned corporations, as provided in a bill reported to the Senate, to build and operate plants on government account for such purposes as purely official determinations may indicate. Industry after industry is coming forward with ample demonstration of its own ability to carry the load of any part of national-defense preparations that falls in its field.

"National security requires, the *Washington Review* continues, "not the interposition of new government controls, direct or indirect, but the release of our economic energies from the handicaps that have been placed upon them in the name of reform and in the name of regulation, but which go beyond the bounds of either. The capital markets can be released without impairment of protection to security-holders. Proper provision can be made plain in tax laws to assure protection of new capital placed in plant and equipment necessary for production for national defense. Industrial operations can be assured such administration of labor legislation as will prevent interference from outside sources seeking to promote selfish interests by taking advantage of the country's needs. Nothing less will bring restoration of morale and confidence in both workers and management that then can proceed toward swift accomplishment of their tasks. . . . Every measure of preparedness, whether financial or in any other field, should have as its purpose the rebuilding of belief in individual endeavor and thrift, of confidence that savings can be protected and will bring a just return, and of ability to make certain provisions for individual security. These are the elements which, with adequate national defense, will give a national security that cannot be shaken."

Prompt placement of orders of immediate production of the chief items of munitions essential to rearmament, without waiting for the formulation of a comprehensive defense program, is advocated by Col. Leonard P. Ayres, vice-president of the Cleveland Trust Company, in the bank's business bulletin. These essentials he enumerated as aircraft, anti-aircraft guns, tanks, motorized military vehicles and artillery. "These essential orders, Col. Ayres said, "should be of sufficient size to result in developing specialized industrial productive facilities and capacities adequate for manufacturing such additional amounts of munitions as may be needed later on. The essence of the problem is swift progress in the development of productive capacity for making the specialized products we must have.

"We do not need to wait until we can decide how large an army we intend to have later on or just how its divisions are to be organized and armed. The first essential in our defense program is to create and install the equipment and to begin training workers in

the required skills. The first steps can be taken as soon as initial large orders are placed, and that is the only way in which those first steps can be taken effectively. Of course, a program of rearmament calls for the large-scale production of literally thousands of other items, but the making of most of them does not involve serious time-consuming difficulties like those encountered in producing the five classes of munitions mentioned. We now have, or can readily create, ample manufacturing capacity for making most of them in such quantities as may be required. Our pressing problem is to create capacity for making the difficult and time-consuming ones."

Col. Ayres observes that neither exports of munitions nor domestic production of planes, and the naval vessels of the United States' own rearmament program have thus far contributed in any important degree to the upturn of industrial production that is now under way. He states, however, that the continuation and expansion of the production of materials required in the defense program may be depended upon to be important factors in the expansion of industrial activities during the coming months. He also states that the severe declines recently experienced by security prices, due to the desire of investors to obtain liquid funds, "are not justified by actual or prospective declines in the earning power of corporations."

Invention Makes Jobs Says Sales Head

Research and invention mean more jobs and new demands for products of industry, Ralph Kelly, vice president in charge of sales, Westinghouse Electric and Manufacturing Company, recently told the Edison Electric Institute convention at Atlantic City.

The speaker said that while the products of inventive genius save labor they actually create more jobs. "Seldom does a new product spell doom to its predecessors," he declared. "It simply creates a new demand or enlarges an old one."

Asserting that under the American way of work "our problem is to give the public the best electrical service the world affords, and never to be satisfied that it cannot be improved," the sales executive disclosed that 10 per cent of his Company's investment in plant facilities consists of laboratories, test equipment and service facilities devoted almost entirely to the advance and improvement of the electrical art.

"The keystone of our research down through the years," he continued, "has been to accomplish ends which were practical; for example, to produce lower loss steel for transformers, higher capacity circuit interrupting devices, more efficient lamps or more enduring insulation—but always to accomplish these objectives by thorough methods. Our research has been a tedious painstaking route to progress. For every way we have discovered to do something, we have probably discovered one hundred ways not to do it."

Mr. Kelly concluded: "Because we have faith in the future, we are enlarging our engineering and research facilities. We are increasing our efforts to promote the increased use of electric power."

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

Months	1940	1939	1938	1937	1936	1935	1934
January	90.2%	77.5%	63.9%	90.3%	76.1%	65.8%	.....
February	86.2%	81.7%	68.7%	90.1%	77.9%	70.0%	.....
March	83.9%	84.0%	69.6%	90.3%	76.0%	70.5%	.....
April	86.3%	82.9%	68.3%	92.1%	82.3%	70.0%	.....
May	91.5%	80.2%	69.0%	90.6%	81.6%	69.4%	.....
June	.....	79.7%	66.0%	87.3%	80.7%	72.3%	.....
July	.....	75.2%	72.0%	81.8%	77.3%	64.9%	.....
August	.....	82.9%	77.2%	82.9%	81.5%	70.9%	.....
September	.....	88.7%	76.3%	78.6%	80.5%	71.9%	58.2%
October	.....	96.6%	82.5%	73.5%	87.6%	75.6%	64.7%
November	.....	97.2%	79.6%	61.9%	88.0%	75.3%	61.7%
December	.....	91.1%	74.4%	54.5%	85.9%	71.2%	59.6%
Year Average.	.....	84.9%	72.3%	80.6%	81.3%	70.5%	.....
First 23 weeks	88.1%	81.3%	67.6%	90.3%	79.0%	69.1%	.....

COMPARATIVE WEEKLY SUMMARIES[1]

CURRENT WEEKS, 1940		CORRESPONDING WEEKS, 1939	
May 4	91.1%	May 6	83.6%
May 11	90.5%	May 13	82.0%
May 18	92.5%	May 20	81.3%
May 25	93.7%	May 27	79.9%
June 1	89.9%	June 3	74.2%
*June 8	93.8%	June 10	79.3%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting—Current Weeks					
Ratio Limits	May 4, 1940	May 11, 1940	May 18, 1940	May 25, 1940	June 1, 1940	June 8, 1940
0% to 50%	44	47	41	40	57	29
51% to 100%	253	250	248	247	224	205
Total Mills Reporting	297	297	289	287	281	234

PAPERBOARD OPERATING RATIOS

Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1936	62%	67%	67%	70%	69%	70%	69%
1937	80%	86%	86%	88%	85%	77%	66%
1938	54%	60%	61%	57%	58%	56%	57%
1939	60%	67%	71%	69%	64%	67%	63%
1940	71%	70%	69%	70%	76%	....	....

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1936	75%	78%	82%	80%	74%	72%
1937	74%	69%	65%	55%	45%	73%
1938	66%	66%	70%	65%	59%	61%
1939	72%	74%	84%	81%	71%	70%
1940	....	....	....	....	....	....

Week end. May 4, 1940—77%
Week end. May 11, 1940—74%
Week end. May 18, 1940—76%
Week end. May 25, 1940—79%
Week end. June 1, 1940—75%
Week end. June 8, 1940—77%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

* Preliminary figure.

Yugoslavia Pulp Production Limited

WASHINGTON, D. C., June 19, 1940—Production of wood pulp in Yugoslavia is very limited in view of its vast forest resources. Local production supplies only a small part of the needs of the domestic mills and the greater part of the paper industry's requirement is imported.

Unbleached sulphite, mechanical wood pulp, and to a lesser degree, soda pulp, are manufactured locally. Unbleached sulphate also can be manufactured but it does not appear that any quantity of it worth mentioning is produced. None of the factories possess the required equipment for the production of bleached sulphite or bleached sulphate pulp. Four enterprises in Yugoslavia manufacture unbleached sulphite, having a combined annual capacity of 38,000 metric tons. Mechanical pulp is manufactured by 6 firms, with a combined capacity of 12,000 metric tons.

FOR color quality in specialty and other papers, the following selected Du Pont pigment colors are particularly recommended. They will produce medium to heavy shades on all grades of stock.

MONASTRAL* Fast Blue BWD
MONASTRAL Fast Green GSWD

Two outstanding developments in the pigment field. They possess fine purity of tone and brilliancy of shade combined with extreme fastness to light and very good resistance to chlorine, acids and alkalis. These products are especially suited to coloring chemical and heat treated papers requiring brilliancy and permanence.

LITHOSOL* Fast Yellow HV 20% Paste
LITHOSOL Fast Yellow 10G Paste
LITHOSOL Fast Yellow HLD 40% Powder

These products demonstrate very good fastness and will not darken on exposure as will chrome and canary yellows. They produce bright yellow shades on wrapping, coffee bags and similar papers. Combined with Du Pont Paper Blue S, bright greens on tire wrap may be obtained.

LITHOSOL Fast Green B Powder

A well-dispersed pigment used extensively for producing fast-to-light green shades in wrapping, tire wrap and similar papers. It may be added dry to the beater, developing maximum strength rapidly, and is very fast to acid, alkali and chlorine.

DU PONT Paper Blue S

A product yielding bright, greenish blue shades possessing excellent fastness to light. Suitable for use on blotting, tire wrap, wrapping and other papers where two-sidedness is not a factor.

Products marketed under the names of HALOPONT* and PONSOL* are especially adapted to the tinting of whites.

* REG. U. S. PAT. OFF.

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WILMINGTON, DELAWARE

Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Conductometric Analysis of Bisulphite Pulping Liquors

By E. R. Whittemore[1] and S. I. Aronovsky[1]

Abstract

A rapid improved conductometric titration method is described for the analysis of acid sulphite pulping liquor. The curve of a single conductometric titration using standard alkali gives the two end points necessary for the calculation of free, combined, and total sulphur dioxide. The error due to the usual phenolphthalein end point and the complication of independently standardized sodium hydroxide, and of sodium thiosulphate and iodine are avoided.

The calcium content of the liquor may be determined directly by conductometric titration with standard oxalate solution. The conductometric titration method may be used to indicate the continuous complex changes in an acid sulphite liquor during the digestion of pulp and should offer a control method for the degree of digestion in industrial pulping and for the subsequent utilization of the waste liquor.

The apparatus involved is simple and inexpensive, and is useful for a large variety of analytical procedures.

This method should be an improvement over existing methods, both for mill control and research work, as it affords a saving in time and chemicals and does not require extensive technical training on the part of the operator.

The older method of analysis of acid sulphite liquor employing an iodine titration for the sulphite ion and titration with standard alkali for total free acid is in general use *(7, 8)*. Two separate samples of the original liquor as well as two independently standardized titrating agents are required, and one of these standards (iodine-potassium iodide solution) is rather expensive.

The substitution of calcium hypochlorite *(3)* for the iodine-potassium iodide solution reduces the cost of the individual sulphite liquor analysis, but this method also requires two samples. In the analysis of an ammonium bisulphite liquor, the calcium hypochlorite method affords the determination of both ammonia and sulphur dioxide. Recent methods, using sodium iodate *(6)* and sodium chlorite *(1)*, have introduced cheaper titrating agents and require only one sample.

In 1931 Jander and Jahr *(2)* described a conductometric method for analyzing sulphite liquors. This method consisted of oxidation of the sulphite ion to sulphate by means of hydrogen peroxide, boiling to destroy excess peroxide, and conductometric titration of the resulting solution at the boiling point with standard barium hydroxide. The free, combined, and total sulphur dioxide could thus be determined by one titration on a single sample.

The present paper reports on the application of the simplified conductometric titration methods and equipment, previously applied in this laboratory to soda *(5)*, nitric acid *(10)*, and sulphate *(9)* pulping liquors, to the titration at ordinary room temperatures of acid sulphite raw and waste liquors, employing a single sample, and using either calcium or sodium hydroxide as the titrating agent. This method is to be preferred to the Jander and Jahr method, because (a) no preoxidation or other pretreatment of the sample is involved; (b) the titration is carried out at ordinary room temperature; (c) inexpensive, simple direct reading equipment is used, thus eliminating the necessity for any recalculation of the data obtained.

Results and Discussion

Raw Sulphite Liquors

Figure 1A shows the conductometric calcium hy-

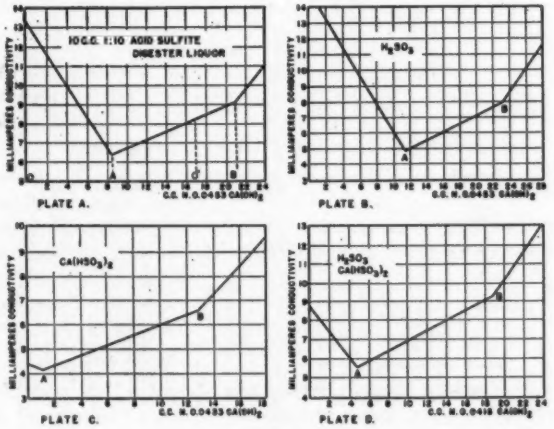

Fig. 1
Conductometric Titration of Acid Sulphite Liquor and Its Components

[1] Member TAPPI, Agri. By-Products Laboratory, Bureau of Agri. Chemistry and Engineering, U. S. Dept. of Agri., Iowa State College, Ames, Iowa.

droxide titration of industrial raw bisulphite liquor. This curve consists of three straightline sections: *O* to *A*, *A* to *B*, and *B* to the end of the titration. The distance (horizontal projection) *OA* indicates the calcium hydroxide equivalent of sulphurous acid titrated to calcium bisulphite. The calculated distance *AO'*, equal to *OA*, represents the titration of this same sulphurous acid from calcium bisulphite to neutral calcium sulphite; the distance *OO'* thus represents the titration of free sulphurous acid to neutral calcium sulphite.

The distance *AB* indicates the actual titration of total calcium bisulphite to neutral calcium sulphite, i.e., the bisulphite formed from the sulphurous acid plus that originally present in the solution. The distance *O'B*, found by subtracting *OA* from *AB*, represents the titration of the calcium bisulphite originally present in the solution to neutral calcium suphite. The section of the curve beyond *B* is due to excess calcium hydroxide over that required for the complete neutralization of the liquor.

In terms common to sulphite mill practice, the distance *OB* represents *free* sulphur dioxide, i.e., free sulphurous acid plus the amount of this acid in the calcium bisulphite present in the original solution. A calculated distance, twice *AB*, represents *total* sulphur dioxide as obtained by the usual iodine titration. The *combined* sulphur dioxide is calculated either as 2 (*AB*) minus *OB*, or more directly as *AB* minus *OA*. (The value of 2 (*AB*) corresponds to the usual iodine titration, while *OB* corresponds to the titration of free acid with sodium hydroxide.)

The titration of the individual components of the liquor is shown in Fig. 1B, C, D. Fig. 1B shows the conductometric calcium hydroxide titration of sulphurous acid in which the horizontal intercepts of the first two straight-line sections are equal and correspond to the titration of the first and second hydrogens of the sulphurous acid. Figure 1C shows the titration of bisulphite, containing a small excess of sulphurous acid, to neutral calcium sulphite. Fig. 1D indicates the titration of a laboratory mixture of sulphurous acid and calcium bisulphite and is similar to the curve in Fig. 1A.

Both high calcium and dolomitic limes are commonly used in industrial sulphite practice. Fig. 2 illustrates a conductometric determination of calcium and magnesium in sulphite liquor. The total calcium

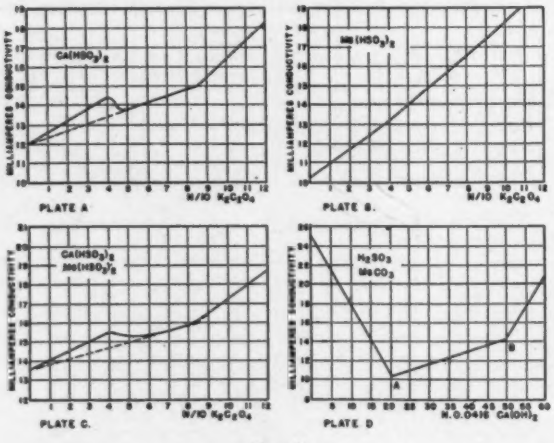

FIG. 2.
Conductometric Titration of Calcium and Magnesium Bisulphites

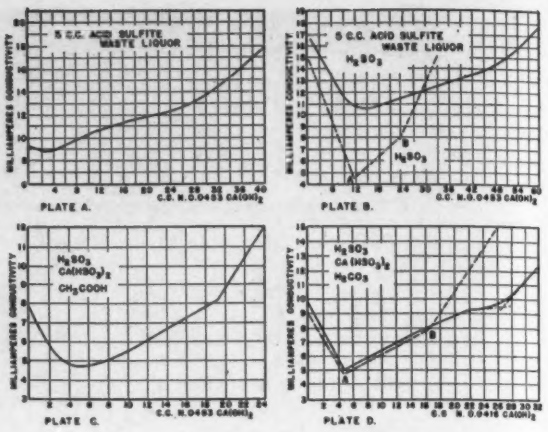

FIG. 3.
Conductometric Titration of Sulphite Waste Liquor and Its Acidic Components

and magnesium as bisulphite is determined with standard calcium hydroxide. The calcium is determined by titration with standard potassium oxalate at *p*H 4.5, and the magnesium is obtained by difference. The titration of pure calcium bisulphite solution, previously adjusted to *p*H 4.5 with ammonium hydroxide *(4)*, using standard potassium oxalate is shown in Fig. 2A. There is evidence of delayed precipitation in the first portion of the curve, a relatively steep, initial straight-line slope that abruptly drops to the lower straight-line slope of normal calcium oxalate precipitation at about the midpoint of the titration. (It is interesting to note that a projection of the initial slope to its intersection with the excess standard oxalate line has twice the horizontal intercept of the normal oxalate titration.) Fig. 2B shows that in the conductometric titration curve of magnesium bisulphite, under the same conditions, only a scarcely perceptible break occurs. Fig. 2C shows that in the titration of a mixture of the same quantities of calcium and magnesium bisulphites used in the solutions for Fig. 2A, B, the sharp break between the projected slopes of the curve at 8.5 cc. corresponds to the calcium content of the mixture. Fig. 2D shows the titration of magnesium bisulphite with calcium hydroxide, and indicates that the latter reagent cannot be used to differentiate between calcium and magnesium bisulphites.

Waste Sulphite Liquor

Fig. 3A shows the conductometric calcium hydroxide titration of acid sulphite waste liquor. It will be noted from the comparative size of the samples and the final end points obtained that waste liquor has about one-fourth the titration value of raw liquor. There is a very marked change in the character of the curve from that obtained with raw liquor. The steep, initial slope in the raw acid curve (Fig. 1A) as well as the sharp breaks in the curve have disappeared. This suggests the possibility of using conductometric titration as a control test for sulphite digestion.

A study was made of the effects of some of the known components of waste sulphite liquor by adding these components to commercial waste liquor and to liquors prepared in the laboratory from pure chemicals. Fig. 3B shows the effect of sulphurous

acid added to waste liquor. The added acid appears in the conductometric titration curve as a steep, initial slope; this slope, however, does not continue as a straight line to 11.5 cc., the *A* end point of sulphurous acid (as shown in the dotted curve for sulphurous acid alone), but appears to merge into the initial curvature obtained with waste liquor. The added acid increased the bisulphite portion of the curve, but the amount of the increase is difficult to establish due to the curvature obtained near the end of the titration.

The addition of acetic acid to a raw sulphite liquor prepared in the laboratory introduces curvature in place of the sharp *A* end point as shown in Fig. 3C. The *B* end point is increased by the amount of the acid added, but its sharpness is not affected. The curve for formic acid addition to raw sulphite liquor, not given in this paper, was very similar to the acetic acid curve.

The addition of carbon dioxide solution to a mixture of sulphurous acid and calcium bisulphite gives a very different curve from that obtained with acetic acid, as shown in Fig. 3D. (The dotted curve is for the raw bisulphite mixture.) The *A* end point is not modified as to position or sharpness. The *B* end point is increased by the equivalent of the calcium bicarbonate formed, followed by the curvature of the precipitation of calcium carbonate. The intersection of the projected slopes in this final curved portion enables a reasonably accurate carbonate determination to be made. Evidently carbon dioxide is aborbed in this rather dilute acid solution at room temperature, and is titrated after neutralization of the bisulphite.

The effects of the addition of salts to waste and to raw acid sulphite liquors were also studied. The solid line in Fig. 4A shows the titration of a mixture of calcium acetate with the sulphurous acid-calcium bisulphite solution (the latter represented by the dotted curve). The free sulphurous acid reacts with the calcium acetate to form equivalent amounts of acetic acid and calcium bisulphite. The initial portion of the curve shows the characteristic acetic acid titration *(9)*; this is followed by the calcium bisulphite titration to a sharp *B* end point which is displaced by the distance equivalent to the amount of calcium acetate added.

Fig. 4B shows the effect of calcium bicarbonate added to the typical acid sulphite solution. The bicarbonate apparently reacts with the free sulphurous acid to form carbonic acid and calcium bisulphite with a small residue of free sulphurous acid. The titration curve of the mixture shows the following order of titration: residual free sulphurous acid to calcium bisulphite ending in a sharp break at 1 cc.; carbonic acid to calcium bicarbonate completed at 7 cc.; calcium bisulphite to neutral calcium sulphite at 19 cc.; and calcium bicarbonate to calcium carbonate along the characteristic precipitation curve.

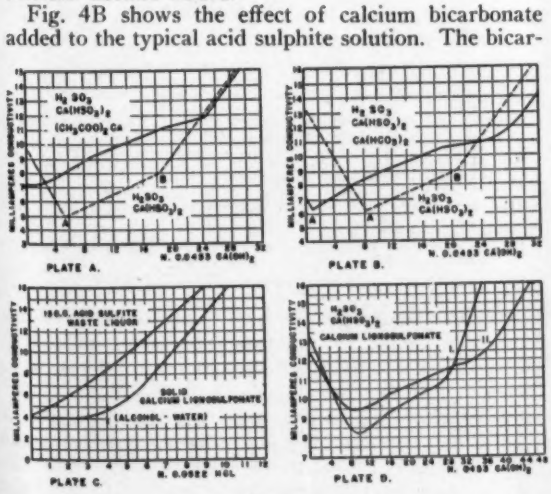

FIG. 4.
Conductometric Titration of Some Constitutents of Sulphite Waste Liquor

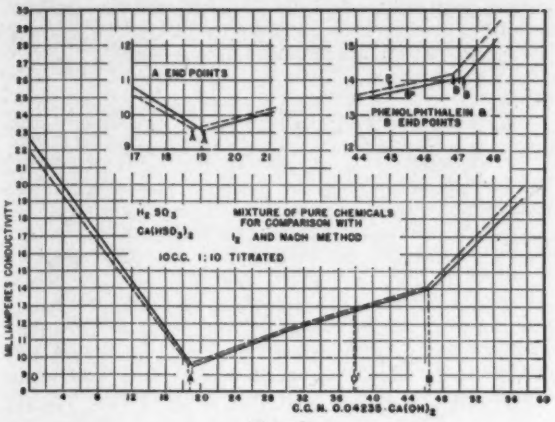
A END POINTS
PHENOLPHTHALEIN & B END POINTS
MIXTURE OF PURE CHEMICALS FOR COMPARISON WITH ½ AND NaOH METHOD
10 C.C. 1:10 TITRATED
MILLIAMPERES CONDUCTIVITY
C.C. N. 0.04235 Ca(OH)2

FIG. 5.
Comparison of Conductometric and Indicator Titrations of a Sulphite Liquor

Fig. 4C shows two interesting conductometric acid titration curves. The upper curve shows the conductometric titration of waste sulphite liquor with hydrochloric acid. A straight-edge placed on the curve indicates that the latter grades into the straight line of excess hydrochloric acid at about 5 cc. (Neutral calcium sulphite can be titrated conductometrically with hydrochloric acid, giving a straight-line descending slope and a sharp end point for the formation of calcium bisulphite.) The second curve of Fig. 4C indicates the titration of an aqueous suspension of granular commercial calcium lignosulphonate with hydrochloric acid. This material was slowly soluble in water, and, from its manufacture by precipitation with lime, it is alkaline in character. It is readily soluble in hydrochloric or in sulphurous acid and in raw acid sulphite liquor.

Curves I and II, Fig. 4D, show the effect of adding calcium lignosulphonate to acid sulphite solution, the amount added for Curve II being twice that used for Curve I. It will be noted that the lignosulphonate partially represses the free sulphurous acid; introduces the curvature characteristic of formic and acetic acids at the usual *A* end point; results in curvature similar to that obtained with bicarbonate, at the usual *B* end point; and increases the total titration.

These preliminary studies on acid sulphite waste liquor indicate that a qualitative division into acid groups of decreasing strength may be made by conductometric titration of the liquor with alkali. This grouping includes stronger acids of the sulphurous acid type, followed by weaker acids in the range of formic and acetic acid, then those acids or salts corresponding in strength to calcium bisulphite, and finally the weak acids and salts of the carbonate type. With further study it is possible that the individual components of those groups could be defined by conductometric analysis since the major components of the waste sulphite liquor are already

quite generally known. Conductometric titration should, therefore, be an important and useful tool for research on waste acid sulphite liquor.

Comparison of Conductometric and Indicator Titrations of Bisulphite Liquors

The comparison of conductometric and phenolphthalein end points on duplicate samples (represented by the solid and dotted curves, respectively) of a sulphurous acid-calcium bisulphite solution, using calcium hydroxide as the titrating agent, is shown in Fig. 5. The sulphite acid liquor was diluted 1:10, and 10 cc. aliquots, equivalent to 1 cc. of the original liquor, were used in these titrations. Both types of end points were taken during each titration and are indicated by enlarged sections in the upper part of Fig. 5. It can be seen at once that the two end points vital to sulphite liquor analysis are sharply indicated in the conductometric curve, and that six well-placed readings would locate the straight-line sections of the curve and accurately fix the end points, *A* and *B*. The phenolphthalein end points, indicated by *P*, give low results for free and high results for combined sulphur dioxide. Similar results are obtained by using sodium hydroxide instead of calcium hydroxide as the titrating agent.

Table I shows the calculation of total, free, and combined sulphur dioxide from the *A* and *B* conductometric end points in the above titrations. Table II shows the end points and the calculation of total, free, and combined sulphur dioxide as obtained with the standard method using the phenolphthalein and starch-iodine end points of the usual standard method. The 20-per cent error in combined sulphur dioxide and the appreciable error in free sulphur dioxide, due to the phenolphthalein end point, are readily apparent from the tables.

Conclusions

1 A rapid improved conductometric titration method is described for the analysis of acid sulphite pulping liquor. The curve of a single conductometric titration made at room temeprature using standard calcium hydroxide gives the two end points necessary for the calculation of free, combined, and total sulphur dioxide. If the approximate concentration is known, it is necessary to obtain only six readings to give an accurate determination of free, combined, and total sulphur dioxide.

2 The error due to the phenolphthalein end point and the complication of independently standardized sodium hydroxide and of sodium thiosulphate and iodine are avoided.

3 The calcium content of the liquor may be determined by conductometric titration, at *p*H 4.5, with potassium oxalate. Magnesium apparently does not interfere with this determination.

4 The conductometric titration method may be used to indicate the continuous complex changes in an acid sulphite liquor during the digestion of pulp and should offer a control method for the degree of digestion in industrial pulping.

5 In conductometric titration such organic acids as formic and acetic interpose their characteristic curves to replace the sharp end points between the acid and bisulphite lines in the curve of an acid sulphite liquor.

6 Conductometric titration shows that calcium acetate reacts with the sulphurous acid of an acid sulphite liquor to form acetic acid and calcium bisulphite.

7 Conductometric titration shows that carbonic acid can exist in dilute acid sulphite liquor. The first and second hydrogen ions of carbonic acid are titrated immediately before and following the calcium bisulphite.

8 Calcium lignosulphonate introduces the organic acid and bicarbonate curvatures in the conductometric calcium hydroxide titration of acid sulphite liquor. The conductometric titration method may afford a basis for the determination of calcium lignosulphonate, either in the solid form or in solution.

TABLE I.—CONDUCTOMETRIC TITRATION OF ACID SULPHITE LIQUOR
(one cc. original liquor)

End points: Observed for 0.04235 *N* $Ca(OH)_2$		End points: Calculated for 0.10 *N* $Ca(OH)_2$		0.10 *N* $Ca(OH)_2$ equivalents for sulphur dioxide			Sulphur dioxide in liquor		
A	B	A	B	Total 2(B-A)	Free B	Combined B-2A	Total	Free	Combined
cc.	cc.	cc.	cc.	cc.	cc.	cc.	%	%	%
19.10	47.20	8.09	19.99	23.80	19.99	3.81	7.62	6.40	1.22
18.75	46.85	7.94	19.84	23.80	19.84	3.96	7.62	6.35	1.27
				Average					
18.93	47.03	8.02	19.92	23.80	19.92	3.88	7.62	6.37	1.25

TABLE II.—INDICATOR TITRATION OF ACID SULPHITE LIQUOR
(one cc. original liquor)

Titrations for: Free sulphur dioxide	Total sulphur dioxide		Difference	Sulphur dioxide in liquors		
0.10 *N* NaOH	0.10 *N* I_2	0.10 *N* $Na_2S_2O_3$	0.10 *N* I_2 used	Total	Free	Combined
cc.	cc.*	cc.	cc.	%	%	%
19.19	43.95	20.10	23.85	7.63	6.14	1.49
19.09	43.95	20.13	23.82	7.62	6.12	1.50
19.17	43.95	20.10	23.85	7.63	6.13	1.50
			Average			
19.15	43.95	20.11	23.84	7.63	6.13	1.50

* 50 cc. I_2 calculated to 0.10 *N* solution.

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Brazil Moderates Pulp Requirements

Washington, D. C., June 19, 1940—A circular issued by the Brazilian Ministry of Finance and promulgated in the Diario Oficial again moderated the previous requirements for the perforation of imported paper pulp, by permitting a new and more advantageous form of perforation, which reduces the number of perforations required, according to a report from the office of the American Commercial Attache, Rio de Janeiro.

Sampling Paper for Testing*

Revision of TAPPI Standard T 400 m-36

Test Sample

The test sample, unless otherwise specified, shall consist when possible of specimens each cut not less than 11 by 11 inches. This allows margin for trimming exactly 10 by 10 inches which simplifies the calculation of basis weight determination. The specimens shall consist of a sufficient number to complete the tests. They shall be kept smooth and flat and protected from exposure to direct sunlight, contact with liquids, and other harmful influences. Care should be exercised in handling the specimens if optical, surface, acidity or other physical or chemical characteristics affected by the moisture of the hands are to be determined. In the case of a test for moisture the test sheets shall be placed, immediately after sampling, in a can made airtight by means of a cover and kept in this condition until the moisture test (T 412 m) is performed. Where an accurate moisture test is important, it is desirable to take a separate sample for this and weigh the sample before opening the container.

Procedure for Sampling

The specimens comprising the test sample shall be so selected as to be representative of the entire lot of paper. One set of specimens shall be taken from one unit out of every twenty in the shipment, except that the minimum number of sets taken from a shipment shall be 5 and the maximum number 20. The same number of specimens shall be taken from each unit.

The units shall be rolls, cases, frames, skids, or bundles.

In the case of rolls special care shall be taken to select test sheets that are not damaged. It is good practice to discard the first three layers of the roll to be sure of obtaining a unit sample in good representative condition. The specimens shall be cut from sheets taken across the full width of several unharmed layers.

In the case of sheet-cut paper, specimens shall be cut from at least 5 consecutive sheets taken from a point or points over ½ inch from the top or bottom of each case, frame, skid or bundle sampled.

The specimens shall be trimmed with their edges exactly parallel to the machine and cross directions of the paper.

A sufficient number of specimens from each unit sample shall then be arranged consecutively in rotation to form a representative test sample. A convenient way to do this is to number consecutively the sheets comprising each set and then select sheets bearing consecutive numbers, one or more from each set in rotation.

Resampling

In case of necessity for resampling a lot of paper, the samples shall be taken as described above, except that the sample sheets shall be taken from different units than those previously sampled.

* TAPPI Standard T 400 m-40.
Note. Physical tests except for weight shall not be made on portions of specimens in which there are flaws or watermarks.

Atmospheric Durability of Nickel-Copper Containing Steels

Results of corrosion tests on low alloy sheet steels containing nickel and copper show that the beneficial effects of nickel upon the weathering resistance of steel increase with increasing nickel content and are enhanced by the addition of optimum amounts of copper. N. B. Pilling and Dr. W. A. Wesley, director and assistant director, respectively, of the Bayonne, N. J., Research Laboratory of The International Nickel Company, Inc., will so state in their paper on "Atmospheric Durability of Steels Containing Nickel and Copper" to be presented at the Corrosion Session at Chalfonte-Haddon Hall, Atlantic City, N. J., on Wednesday evening, June 26, during the forty-third annual meeting of the American Society for Testing Materials.

Some of the tests have extended over a period of 15 years in rural, urban, industrial, and marine atmospheres. Six series of tests will be reported, varying from exposures of large specimens designed to simulate actual roofing conditions, to practical railroad coal car tests. Commercial significance of the data is broadened by the multiplicity of compositions tested.

The superiority of nickel-copper steels is particularly pronounced in a marine atmosphere, tests here showing that nickel-copper steels containing more than 2 per cent alloy outlasted copper steels 200 to 300 per cent at the end of six years weathering, the authors will contend. Results of tests on open hearth steels used on the droppers and bottoms of 50-ton railroad coal cars engaged in transporting bituminous coal showed a two to one superiority for nickel-copper steels over unalloyed and copper steels after six years in service.

The effects of manganese, silicon, and carbon contents do not appear to be important, but the presence of a moderate amount of phosphorus seems to be beneficial in nickel-copper steels.

Sweden's Production Index Rises

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 19, 1940—Sweden's general production index rose in January. The wood pulp and paper production index during the month rose to 120 as compared with 94 in January 1939.

Terephthalic Acid Method for Determination of the Acidity of Paper*

By B. L. Browning[1] and G. C. Kimble[2]

Abstract

An analytical method has been developed for the determination of the total acidity of paper by the use of sodium terephthalate solution. In contrast to the water extraction method, the total acidity is determined by a single treatment. The results obtained are easily reproducible.

According to the methods now in use, the total acidity of paper is determined by extraction of the sheet with hot water and titration of this extract with alkali, as described in TAPPI Standard T 428 m-39 *(6)*. The values obtained by this procedure are reproducible only if the conditions of extraction, such as time, temperature, and water-paper ratio, are kept constant. In addition, it is recognized that one extraction of a paper sample does not remove all of the acid, additional acid appearing even after four or five extractions. It is stated that the acid number obtained on one extraction is about three-fourths that obtained by three extractions *(6)*, but this proportion may not be constant if different proportions of acidic materials are present.

The use of terephthalic acid and sodium terephthalate for determination of the acid or alkali content of wool has been described by Hirst and King *(2)*. The very interesting properties of terephthalic acid and its salts suggested their application in the determination of the total acidity of paper. Terephthalic acid is a fairly strong acid and at the same time is nearly insoluble in water. Sodium terephthalate is a soluble neutral salt which is not appreciably adsorbed by cellulose but may be quantitatively decomposed by free mineral acids with the liberation of an equivalent quantity of insoluble terephthalic acid. The terephthalic acid can be removed by filtration and the remaining sodium terephthalate determined by titration. Conversely, free alkalies react with terephthalic acid to form soluble terephthalates which may be determined by titration.

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 19-22, 1940.

Submitted by the junior author as a thesis in partial fulfillment of the requirements of The Institute of Paper Chemistry for the degree of Master of Science from Lawrence College, Appleton, Wis., June, 1939.

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[2] Student, The Institute of Paper Chemistry, Appleton, Wis.

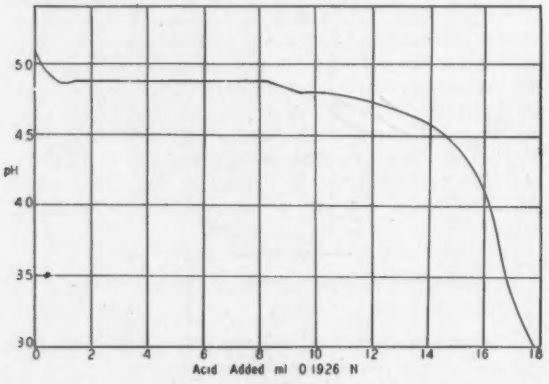

FIG. 1.

Properties of Terephthalic Acid

The following properties of terephthalic acid and its sodium salt were determined by potentiometric titration. A glass electrode was used, and the distilled water employed was purified by redistillation over neutral potassium permanganate.

Solubility

Pure terephthalic acid was found to have a solubility of 0.0166 g. per liter in water at 20 deg. C., in good agreement with the value of 0.0168 given by Hirst and King. An apparent solubility may be realized which is greater than this, if basic materials are present in either acid or water. The limiting value of the solubility in any solution corresponds to the actual concentration of undissociated acid in a pure water solution saturated with the acid and amounts to 2 or 3 by 10^{-5} moles per liter. The correction for dissolved terephthalic acid in acid solutions is small and is not appreciably affected by *p*H below about 3.7. NaCl slightly increases the solubility of terephthalic acid, but in acid solutions the increase is so small that for this salt the effect is unappreciable.

Precipitation

The addition of sufficient hydrochloric acid to reduce the *p*H of a sodium terephthalate solution to 3.7 quantitatively liberates free terephthalic acid. However, terephthalic acid precipitates slowly, and sufficient time must be given to reach solubility equilibrium. Small amounts of the acid may be precipitated much more rapidly by seeding heavily with finely divided solid acid.

Determination of Sodium Terephthalate

A standard solution of sodium terephthalate is prepared by saturation of a NaOH solution with terephthalic acid and removal of the excess acid by filtration. Such a solution contains free terephthalic acid and disodium and monosodium terephthalates. The analysis of sodium terephthalate solutions by precipitation and weighing of terephthalic acid is not generally feasible because of the presence of the monosodium salt.

Direct titration with HCl to an end point at 3.7 *p*H is satisfactory in the case of fairly strong solutions. Figure 1 illustrates the direct titration with HCl of a sodium terephthalate solution diluted to 0.01296 *N*. During the sharp drop in the first part of the curve the solution is being saturated with terephthalic acid. The inflection of the curve corresponding to the completion of the reaction is reached only when the *p*H has been reduced to 3.7.

Direct titration does not yield precise results at dilutions consistent with the analysis of paper extracts. In the titration of approximately 0.001 *N* solutions no usable inflection appears in the potentiometric titration curve.

Satisfactory analysis of dilute solutions is obtained by addition of excess HCl with back titration of the excess acid after removal of the insoluble terephthalic acid. Since the reaction with sodium terephthalate is not complete above 3.7 *p*H, the excess HCl must be equivalent to at least 20 cc. of 0.05 *N* acid per liter of solution. During the back titration the sharp change in *p*H characteristic of the titration of strong acids with strong bases is obtained, and any of the usual indicators may be used.

The insoluble terephthalic acid is removed conveniently by filtration through a Gooch crucible with asbestos mat. A correction must be applied for the slight solubility of the acid. Since the magnitude of this correction is dependent upon temperature, the solution should be kept close to 20 deg. C. or a chosen standard temperature for at least one-half hour before filtration.

The solubility correction to be used is found by diluting various small amounts of standard NaOH up to 250 cc., saturating with terephthalic acid, precipitating with standard HCl under the proper conditions, and back titrating the excess HCl with NaOH. The difference between apparent sodium terephthalate determined and the NaOH originally added is due to the soluble terephthalic acid. The correction used is given in the proposed method.

After filtration, the flask and precipitate must be washed to recover all of the excess HCl. In order to avoid error due to the slight solubility of terephthalic acid in the wash liquid, a saturated aqueous solution of terephthalic acid is used. The titer of this solution is found by titrating 250 cc. with the standard base. Each precipitate is washed with 25 cc. of this solution, measured in a graduate, and the titer subtracted from the base required in the titration of the filtrate.

The Reaction of Alum with Sodium Terephthalate

When a solution of $Al_2(SO_4)_3$ is added to a sodium terephthalate solution at room temperature, a precipitate is formed only after standing overnight. If the mixture is heated to 60 deg. C., a gelatinous precipitate begins to form at once. The completeness of the reaction was studied in a series of quantitative experiments, under a variety of conditions, as shown in Table I.

During the titration of excess HCl with NaOH to a *p*H of 10, no precipitate of $Al(OH)_3$ was observed, indicating initial complete removal of aluminum ions from solution.

TABLE I.—DETERMINATION OF THE ACIDITY OF ALUM

Treatment	Acid found, microequivalents
30 min. at 85-95 deg. C., 2 hr. cold	224
	224
12 hr. at 20 deg. C., 30 min. at 85-95 deg. C., 6 hr. at 20 deg. C.	221
	228
30 min. at 85-95 deg. C., filtered hot	227
	226
Average	225
Calculated from SO_3 in alum	238
Recovery of calculated SO_3, per cent	94.5

Action of Sodium Terephthalate Solution on Pulps

A terephthalic acid analysis of a pulp shows more alkalinity than a water extraction under the same conditions. McLean *(4)* and McLean and Wooten *(5)* have shown that alkali in pulps, which cannot be extracted with water, can easily be removed by dilute acids, probably by an ionic exchange. This treatment reduces the acidity of the solution and the alkalinity of the ash by approximately the same amount. The terephthalic acid extraction probably removes alkali from pulps by the same mechanism. Such metallic ions would not affect the acidity of the water extract of a pulp but would react with acidic constituents of a paper during extraction.

One sodium terephthalate extraction for 30 min. at 85-95 deg. C. was found to remove completely acid or alkali from pulps. A small amount of finely divided solid terephthalic acid was added to take care of possible alkalinity and the alkali calculated from the increase in soluble terephthalates. The usual amount of sodium terephthalate was added to insure a precipitate large enough to separate readily on the addition of acid before the back titration.

The effectiveness of the sodium terephthalate method in removing acids from pulps was determined by adding known quantities of HCl previous to analysis. Five-g. samples of soda pulp were treated with 5 cc. of 0.0541 *N* HCl, and after 30 min. the pulps were analyzed for acidity.

The original pulp and the acid-treated pulp were also analyzed by water extraction under the same conditions as those of the terephthalate analysis. Two hundred and fifty cc. of water were added to 5 g. of pulp, heated at 85-95 deg. C. for 30 min., filtered hot, washed, cooled, and titrated to a Methyl Red end point. The extracts of the original pulps were acidified with standard HCl and back titrated in order to duplicate the end point change.

Five-g. samples of alpha pulp were treated with 5 cc. of the alum solution and analyzed in the same way. The results of these analyses are given in Tables II and III, and show that the terephthalate method determines alkali, acid, and acidity due to alum on pulps much more accurately than a water extraction under the same conditions.

TABLE II.—DETERMINATION OF HCl ADDED TO SODA PULP

Microequivlaents per gram moisture-free pulp	Terephthalate method	Water extraction
Alkali in pulp	13.4	1.5
Acid added	57.4	57.4
Net acidity present	44.0	55.9
Acid found in pulp	44.6	21.9
Percentage of acid accounted for	101	39

TABLE III.—DETERMINATION OF ALUM ADDED TO ALPHA PULP

Microequivalents per gram moisture-free pulp	Terephthalate method	Water extraction
Alkali in pulp	14.0	0.9
Acid found after alum treatment	35.0	13.7
Net acidity present		
A. Acidity calculated from terephthalate analysis	33.7	46.8
B. Acidity calculated from SO_3 content	36.5	49.6
Percentage of alum acidity accounted for		
A. Acidity calculated from terephthalate analysis	104	29
B. Acidity calculated from SO_3 content	96	28

Determination of Acids in Paper

The following papers were analyzed by the terephthalate method and by the water extraction method:

A. An alpha bond, sized in the beater with rosin and alum.
B. A 100 per cent rag bond, beater sized with rosin and alum and tub sized with glue.
C. A 50 per cent rag and sulphite bond, beater sized with rosin and alum and tub sized with starch. Starch was also added in the beater.

TAPPI Standard T 428 m-39 was used, and the extracts titrated potentiometrically with 0.02 *N* NaOH. The titration curves are given in Figs. 2, 3, and 4 (mean of duplicate titrations).

The data for the TAPPI extractions presented in Table IV were obtained by reading the potentiometric titration curves at the *p*H values indicated. The results of the sodium terephthalate method are based upon Methyl Red and phenolphthalein end points, the Methyl Red end point being taken at the color change occurring at 6.0 *p*H.

Phenolphthalein indicator is specified in TAPPI Standard T 428 m-39. The indicated end point is approximately 8.4 *p*H, which is somewhat higher than the correct end point as judged by the inflection point of potentiometric titration curves. On the other hand, Methyl Red indicator changes color at about 6.0 *p*H, at which point almost all of the strong acids and part of the weak acids will have been neutralized. This is some justification for titration only to 6.0 *p*H, since acids neutralized beyond this *p*H may be of insufficient strength to cause paper deterioration.

TABLE IV.—DETERMINATION OF ACIDS IN PAPER

Microequivalents per gram moisture-free paper

Paper	TAPPI extraction method				Sodium terephthalate method
	1. Titration to 6.0 pH				
	1st	2nd	3rd	total	
A	6.4	2.0	1.0	9.4	19.3
B	4.0	3.1	2.6	9.7	12.1
C	22.3	8.3	5.4	36.0	42.5
	2. Titration to 8.4 pH				
A	9.3	3.6	1.9	14.8	21.8
B	7.5	5.0	4.2	16.7	15.9
C	28.7	10.7	6.9	46.3	51.0

Weak acids do not react with sodium terephthalate. However, they appear in the extract and are accounted for to an extent depending upon the indicator used in the final titration with NaOH. If, as stated by Browning and Ulm *(1)*, most of the weak acids appear in the first TAPPI extraction, then the difference in results represented by the Methyl Red and phenolphthalein end points should correspond to the amount of base required to change the *p*H of the first water extract from *p*H 6 to 8.4. The data given in Table IV show the good agreement of the two methods in this respect.

Proposed Method for the Determination of Total Acidity of Paper

Materials

A. 0.05 *N* HCl solution.

B. 0.05 *N* NaOH solution.

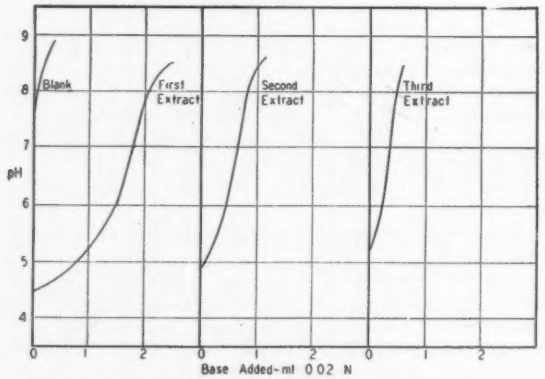

FIG. 2. PAPER A.

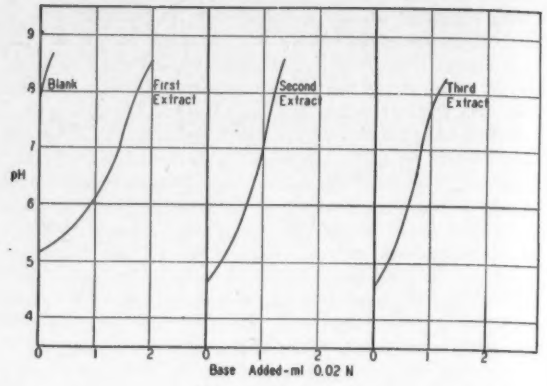

FIG. 3. PAPER B.

C. A saturated terephthalic acid solution. Add an excess of solid terephthalic acid to boiling water, let stand overnight, and filter at 20 deg. C. through an asbestos mat in a Gooch crucible. The titer of this solution is obtained by titrating 250 cc. with the standard NaOH to the indicator end point.

D. 0.015 *N* sodium terephthalate solution. Prepare a 0.015 *N* NaOH solution, add an excess of solid terephthalic acid, heat until acid to Methyl Red, let stand cold overnight, and filter through an asbestos mat in a Gooch crucible. This solution is standardized by titration of 25 cc. in 325 cc. of boiled distilled water after following the analytical procedure of precipitating, filtering, and washing.

E. Indicator. Use phenolphthalein indicator to determine total acids. Methyl Red indicator (titrating to the change from yellow to yellow green) will determine all of the strong acids and part of the weak acids.

F. The test specimen is disintegrated or cut into ¼- by ½-in. strips.

Procedure

Weigh 5-g. (to the nearest mg.) samples for the acid determinations and at the same time weigh samples for the moisture determinations. Transfer each of the weighed samples to a 400-cc. beaker and add 225 cc. of boiled distilled water. Pipette in 25 cc. of the standard sodium terephthalate solution. Cover with a watch glass, heat to 85-95 deg. C., and maintain at this temperature for 1½ hours. A stirring rod is left in the beaker to compress and stir the paper occasionally until it is thoroughly wetted. At the end of this period, cool the beaker rapidly to 20 deg. C. and filter within an hour on filter paper in a

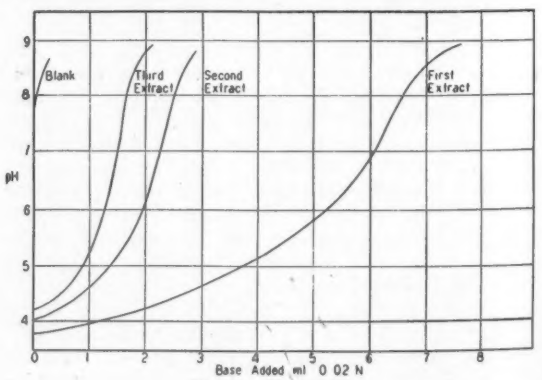

FIG. 4. PAPER C.

Büchner funnel with suction. Wash with 100 cc. of boiled distilled water. Acidify the filtrate with 15 cc. of 0.05 *N* HCl and allow it to precipitate overnight. (If a heavy precipitate of terephthalic acid appears within 5 min., 1 to 2 hours' precipitation time is sufficient; longer periods are necessary if glue or starch is present.) Maintain the temperature at 20 deg. C. for 30 min. and filter on an asbestos mat in a Gooch crucible. Wash the flask and filter with 25 cc. of saturated terephthalic acid solution and titrate with 0.05 *N* NaOH to the end point chosen. Measure the volume after titration to the nearest 5 cc.

CALCULATION

In standardization:

$$N_a = [(N_a)\ (\text{cc. HCl}) + S + T - (N_b)\ (\text{cc. NaOH})]/\text{cc. Na}_2\text{ (tere)}.$$

In analysis:

$$A = \{[(N_b)\ (\text{cc. NaOH}) + (N_a)\ (\text{cc. Na}_2\text{ (tere)})] - [(N_a)\ (\text{cc. HCl}) + S + T]\ (1000)\}/W;$$

$$\text{Percentage } SO_3 = A \times 0.004$$

where:

N_a = Normality of acid
N_b = Normality of base
N_s = Normality of sodium terephthalate
T = Milliequivalents correction for terephthalic acid solution used as a wash. This is calculated from the titration of 250 cc. with NaOH and is approximately 0.005 milliequivalent for 25 cc.
S = Milliequivalents correction for the solubility of terephthalic acid = V x 0.00006 at 20 deg. C. V is the volume in cc., in which the terephthalic acid was precipitated (the final volume measured less the volumes of terephthalic acid solution used as wash and the NaOH titration).
W = Weight of test specimen less moisture
A = Microequivalents acid per gram moisture-free paper.

The calculation is somewhat simplified, if standardization of the terephthalate solution and the actual determination are carried out under exactly the same conditions; i.e., if the same volumes and normalities of sodium terephthalate and HCl solutions are used, and if the same volumes of solutions and temperature of precipitation with excess acid are maintained. Under these conditions the above equations reduce to:

$$\text{Percentage } SO_3 = N_b\ (D - St)/0.25\ W,$$

where:

D = Number of cc of NaOH used in the determination
and St = Number used for standardization.

MODIFICATIONS

In determining alkalies, only 10 cc. of 0.015 *N* sodium terephthalate need be used. A small amount of finely divided terephthalic acid must also be added. This can be used conveniently as a fine suspension reprecipitated from hot water and partially decanted. The supernatant liquor may be decanted through a filter and used as wash solution.

The amounts specified above will cover the ordinary range of paper acidity or alkalinity. If the sample is extremely acidic or basic adjustments must be made so that the excess sodium terephthalate removes at least 3 cc. of 0.05 *N* HCl on acidification and the excess HCl after precipitation is equal to at least 7 cc. of 0.05 *N* NaOH.

Comments on the Method

The actual working time is about one hour per sample. The analysis is more laborious than a single TAPPI extraction but less so than three successive extractions. Although terephthalic acid is relatively expensive (twenty-five cents per g.), the reagent cost is less than two cents per sample.

The TAPPI standard method for total acidity specifies that results of duplicate determinations shall agree within 0.01 per cent SO_3 (equivalent to 2.5 microequivalents acid per g. of paper). Most of the duplicate determinations obtained in use of the terephthalate method were within 1.5 microequivalents of acid per gram.

The effect of neutral salts is so small that it can be neglected. Terephthalic acid releases CO_2 from carbonates and so determines them as alkalies. Salts of other weak acids will be partially determined as alkalies unless phenolphthalein indicator is used in the titration to include all of the liberated weak acid in the final titration.

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A Method of Analysis of Rosin Wax Sizes*

By R. B. Porter[1] and W. M. Thomas[2]

Abstract

A method of analysis of rosin-wax size, based on a direct titration of the size in an alcoholic solution with NaOH, is described. Free rosin acid is determined by titrating directly a sample of the size in an alcoholic medium with alkali. Total rosin is determined by causing the size to be precipitated with strong HCl or H_2SO_4, filtering the precipitate, washing it free of acid, and titrating the precipitate with NaOH in an alcoholic solution. The percentage of wax is determined by difference.

In the manufacture of rosin size or rosin-wax size, it is essential that some method of test be employed to insure uniformity of quality. Generally this test is an analysis of the size to include total solids content, free rosin, total rosin, and in some cases total alkali. One method *(1)* of analysis of rosin sizes is the extraction method, in which the free and combined rosin are determined by an ether extraction. There are, however, some objections to this method in that it requires considerable time to complete and that there are sources of error such that different modifications give varying results. This extraction method is not applicable to a rosin-wax size because of the difficulty of obtaining a complete separation of the rosin and wax. This can be accomplished by selective solvent

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extraction but the procedure involves several careful extractions which detract from the accuracy of the analysis. Several investigators *(2)* have suggested that the percentage free rosin in a size can be determined by dissolving the size in alcohol and titrating the free rosin with alcoholic potash solution. It is the object of this paper to describe a titration method of size analysis that is particularly suitable for a rosin-wax size.

Alkalinity Number

One method of control test in the manufacture of rosin-wax is by the determination of a so-called alkalinity number. This test consists of heating an aqueous dispersion of the size with hydrochloric acid and then titrating the excess acid with sodium hydroxide. The results are expressed in lb. of alkali consumed per 100 lb. of melt. This number can be used as an approximate means of control of the free rosin content during the manufacture of rosin-wax sizes. Experience has proved, however, that not all of the alkali actually present in the size is determined by this method, and this has been confirmed by laboratory experimentation. The method consists of weighing a 6-to 12-g. sample of size into a beaker, dispersing the size in 500 cc. of distilled water, adding 25 to 50 cc. of 0.5*N* HCl and heating the mixture at 190 deg. F. for 15 minutes. The dispersion is then cooled to room temperature and titrated with 0.5*N* NaOH using methyl orange as an indicator. The alkalinity number is then calculated from the following equation:

$$\text{Alkalinity Number} = \frac{\text{cc. HCl} \times \text{normality} \times 4}{\text{weight of sample} \times \text{total solids} \times \text{factor}}$$

This factor may be defined as the fraction of rosin-wax mixture per lb. of dry size. It is calculated from the reaction of rosin and sodium hydroxide as shown by the following reaction:

$$\overset{302}{C_{20}H_{30}O_2} + \overset{40}{NaOH} \rightarrow \overset{324}{C_{20}H_{29}COONa} + \overset{18}{H_2O}$$

Assume for example: 100 lb. of a mixture of 80 parts by weight of rosin and 20 parts by weight of wax.

Assume an acid number for the rosin of 163 or to obtain complete neutralization of the abietic acid with

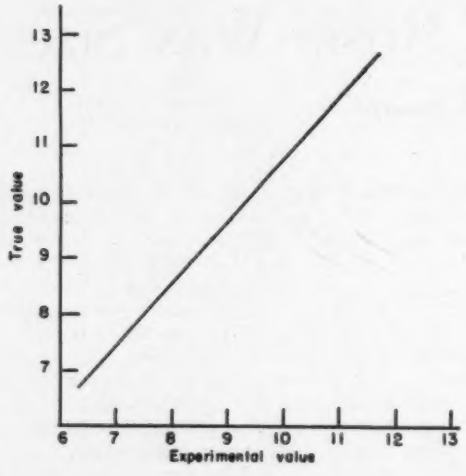


FIG. 1.

Conversion Chart for Alkalinity Numbers. C = 1.13 E — 0.44. C = True Value. E = Experimental Value.

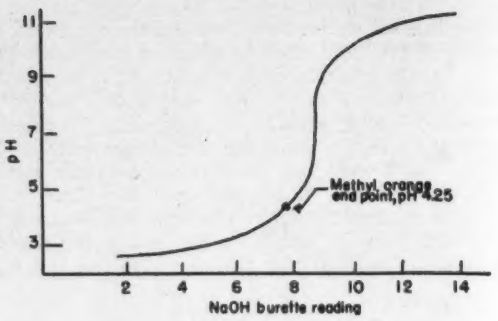


FIG. 2.

Titration Curve. Determination of Alkalinity Number in a Rosin-Wax Size.

NaOH will require 11.6 per cent. Therefore, 80 × 0.116 = 9.28 lb. of NaOH.

For every lb. of NaOH used 22/40th combines with the abietic acid to form sodium abietate, thus 22/40 × 9.28 = 5.1. Therefore 100 lb. of the above mixture will give 105.1 lb. of size. Therefore, in order to convert back to a per lb. basis it is necessary to divide 100/105.1 = 0.95 which is equal to the factor in the above equation.

The relationship between the theoretical and experimental values of the alkalinity number is shown in Fig. 1, in which it is seen that the experimental values are less than the theoretical. Possible sources of error such as the determination of the exact end point, were investigated. It was found that the titration as determined by means of a *p*H meter produced a typical curve confirming the assumption that the reaction was a straightforward one. The principal source of error was then traced to the fact that the reaction between hydrochloric acid and sodium resinate is not instantaneous but requires some time to reach equilibrium. Figures 3 and 4 indicate that even at a temperature of 180 deg. F. the reaction is not complete under the conditions of the test. Although this method is not an ideal one from a scientific point of view, it is suitable for approximate control of the quality of a rosin-wax size. Definite relationships between the alkalinity number, *p*H, and free rosin acid have been established.

In order to determine whether a relationship existed between the alkalinity number, the *p*H value, and the free rosin acid, the following experiment was conducted: the *p*H of sizes of known composition were determined by means of a Thwing-Albert *p*H

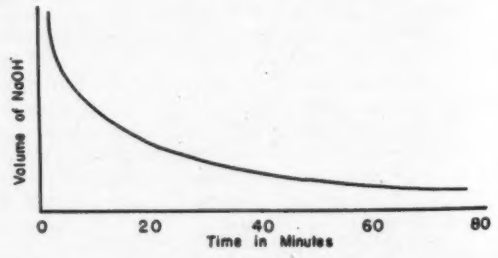


FIG. 3.

Rate of Reaction Between Rosin Soap and HCl as Shown by Titration of the Excess Acid. Temp. 180 Deg. F.

meter using antimony electrodes, a pH buffer solution of 7, agar bridges, and a temperature of 80 deg. F. for the reference electrode and 115 deg. F. for the size electrode. Determinations of the alkalinity numbers and free rosin acid contents of the sizes corresponding to definite pH measurements were also made. Figure 8 shows the relationship existing between these values for a size containing 20 per cent by weight of wax. A mathematical expression can be derived, which is the equation of the straight line expressing the free rosin acid value in terms of the pH.

$$F = 91.4 - 6.09\ [(P + .02(115 - T)]$$

F equals the free rosin acid
P equals the pH reading
T equals the temperature at which pH is measured.

This example is based on an acid number of the rosin of 163 and a wax content of 20 per cent. If either or both of these constants are varied, a new equation will have to be formulated. In actual plant practice, several graphs have been drawn, wherein the acid number of the rosin and the wax content of the size have been varied, so that by a direct determination of the pH, the free rosin acid content of the size can be readily calculated. Although the above discussion outlines a method which is applicable for plant control in the manufacture of rosin-wax size, it is not suitable for accurate analysis of the size. Therefore, the method presented has been developed, where a complete analysis of the size is desired.

Analysis of the Size

The total solids is determined by the usual oven-drying method. Losses due to the volatility of the wax were investigated in order to determine if appreciable loss resulted during the drying period. Although there was a small loss in weight, the magnitude of which depended on the type of wax, it did not effect the accuracy of the determination in excess of 0.01 per cent. Therefore, this loss is neglected in the total solids determination. The method consists of drying a 2-g. sample of size in an oven maintained at a temperature of 220 deg. F. for a period of one hour. This period has been found to be sufficient to reach a constant weight.

Some investigators *(2)* have suggested that the percentage of free rosin in a size can be determined by dissolving the size in alcohol and titrating the free rosin acids with alcoholic potash solution. The general plan of analysis of a rosin-wax size that has been developed is as follows:

(1) A direct titration of a solution of the size in alcohol is made with NaOH solution.
(2) A sample of size is precipitated with acid, filtered, and washed with warm water, dissolved in alcohol and again titrated with NaOH.
(3) The NaOH having been standardized against the rosin used, total rosin is determined from the second titration.

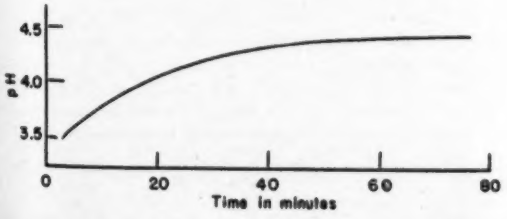


FIG. 4.
Rate of Reaction as Shown by Change in pH of the Solution.

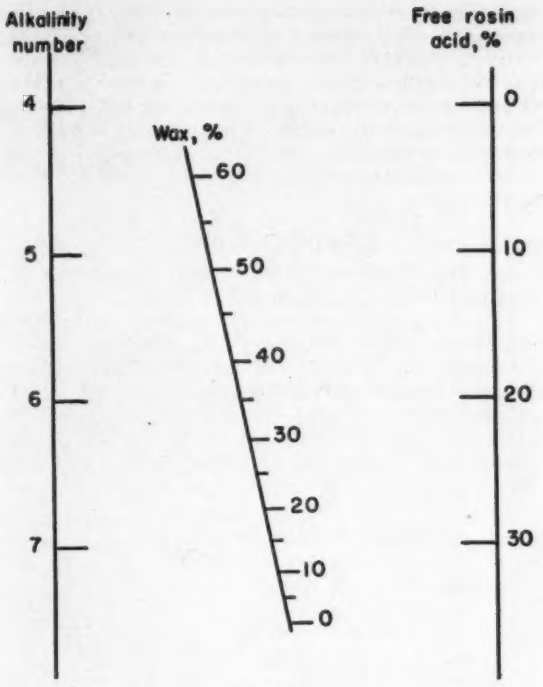


FIG. 5.
Alinement Chart. Based on *G* Gum Rosin; Acid Number, 163.

(4) The unsaponifiable portion is calculated from the average acid number of the type of rosin being examined.
(5) Percentage wax is determined by the difference between total precipitated material and total rosin.

A 5-g. sample of size is weighed into a 200 cc. flask or beaker, dissolved in 75 cc. of warm neutral alcohol, and titrated to the phenolphthalein end point with approximately 0.5*N* aqueous NaOH. A second 5-g. sample of size is weighed into a similar container, dispersed in 100 cc. of distilled water and strongly acidified with hydrochloric or sulphuric acid. The dispersion is then heated to 190 deg. F. and maintained at this temperature for 15 min., after which it is

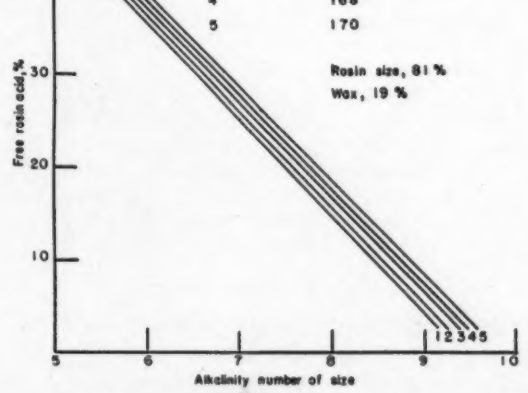


FIG. 6.
Effect of Changes in the Acid Number of Rosin on the Relation of Alkalinity Number to Free Rosin Acid.

cooled until the rosin-wax mass solidifies. The dispersion is then filtered and the precipitate washed with warm water, until the filtrate is neutral to litmus paper. The precipitate (including the filter paper) is then returned to the original container and dissolved in warm neutral alcohol. The solution is then titrated as in the first case. Free rosin acid and total rosin is then calculated as follows:

$$\text{Grams of free rosin acids} = V_1 \times N \times 0.302$$

where V_1 = volume of NaOH used
N = normality of alkali
0.302 is the average milliequivalent weight of rosin acids.

$$\text{Grams of total rosin} = V_2 \times \text{g. rosin/cc. NaOH}$$

Where V_2 = volume of NaOH used.

Grams of rosin/cc. of NaOH is determined by standardizing the rosin used in the manufacture of the size against the alkali used in the titrations. Thus, this method is applicable only where the type of rosin in the size is known. Where it is unknown, it is necessary to separate the wax from the rosin and determine the acid number of the latter.

$$\text{Free rosin acids, \%} = 100 \frac{\text{g. of free rosin acids}}{\text{g. of total rosin}}$$

$$\text{or Free rosin acids, \%} = 100 \frac{V_1 \times N \times 0.302 \times W_2}{V_2 \times \text{g. rosin/cc. NaOH} \times W_1}$$

where W_1 = weight of first sample
where W_2 = weight of second sample

$$\text{Total rosin, \%} = 100 \times \frac{V_2 \times \text{g. rosin/cc. NaOH}}{W_2 \times \text{total solids} \times \text{factor}}$$

The factor is defined as the fraction of rosin-wax mixture per unit weight of dry size or in other words it corrects for the increase in weight caused by the reaction of the rosin acids with NaOH. For a first approximation the value of this factor may be taken as 0.96. If the total rosin is approximately 80 per cent, a value of 0.95 should be used, if 60 per cent a value of 0.96, and if 50 per cent a value of 0.97.

The percentage of wax is determined by subtracting the percentage of total rosin from 100 per cent. Figure 5 may be used to determine the amount of wax.

In this method, the free rosin as determined by titration is in fact free rosin acids. It does not include the unsaponifiable material present in most rosins. If this material is to be included in the results for the free rosin value, it can be calculated by a simple mathematical computation as shown by the following example:

Example of a size containing 52 per cent wax and 48 per cent rosin.
Basis: 100 g. of dry size.

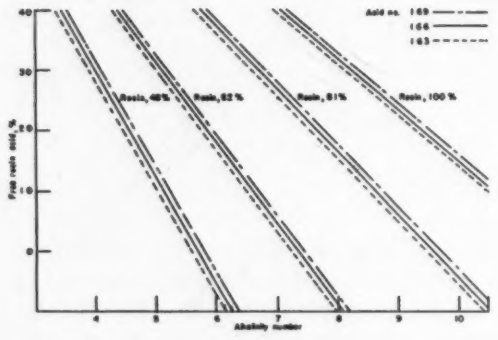


FIG. 7.

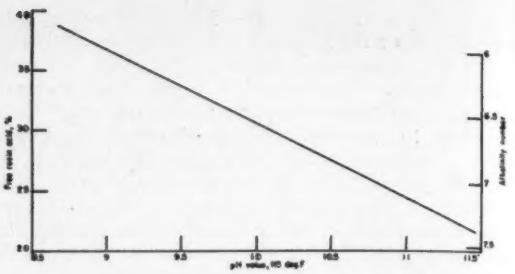


FIG. 8.

$F = 91.4 - 6.09\ (P + 0.02\ (115\text{-}T))$. F = Free Rosin Acid. P = pH Reading. T = Temperature of pH Reading, deg. F.

By titration free rosin acids = 11.8%
Average acid number of rosin = 163
Average acid number of rosin acids = 185

$$\frac{163}{185} \times 48 = 42.3 \text{ g. of acid present}$$

$48 - 42.3 = 5.7$ g. of unsaponifiable material

$$\frac{11.8}{100} \times 42.3 = 5 \text{ g. free acid present}$$

$5.7 + 5.0 = 10.7$ g. of resinous material

$$\frac{10.7}{48} \times 100 = 22.3\% \text{ free rosin}$$

There are some objections to this method of analysis of rosin-wax sizes namely: (1) the acid number of all rosins is not the same; (2) other materials besides rosin may affect the determination; and (3) the rosin is not completely precipitated or removed by the acid and filtration treatment.

Although these objections have some basis, they are not of a serious nature. The acid numbers of gum rosins used in the paper industry do not vary more than 2 per cent with the general average of 165 while the average value of FF wood rosin is 155. Figures 6 and 7 show the effect of the change of the acid number of rosin on this analysis. Other materials, such as secondary stabilizers, are present in such small amounts that their effect is not determinable by experimental procedure. Experiments have shown that the precipitation of the size with acid is complete to such a degree that any effect due to incomplete precipitation does not effect the ultimate analysis.

The average accuracy of the method is shown by the following table:

Experimental			*Theoretical*		
Total rosin	Free rosin	Wax	Total rosin	Free rosin	Wax
81.2	36.3	18.8	81	38.5	19
80.5	35.7	19.5	81	38.5	19
80.5	18.1	19.5	81	19.5	19
81.0	31.5	19.0	81	34.3	19
81.5	33.5	18.5	81	34.3	19
61.8	20.8	38.2	62	21.2	38
61.6	20.0	38.4	62	21.2	38
62.4	12.9	37.6	62	12.3	38
49.0	22.3	51.0	48	25.6	52
47.4	17.0	52.6	48	16.5	52

Conclusion

From the results obtained during the experimentation, it is concluded that the method gives results nearer the theoretical than do the usual extraction methods, and it has the added advantage of being more rapid. A complete analysis can be made in the time that the total solids determination is being made.

Literature Cited

(1) Griffin, R. C., "Technical methods of analysis." 2nd ed. New York, McGraw-Hill, 1927, p. 437.

(2) Dreshfield, Arthur C. *Paper Trade J.* 86, no. 21:59-63; *TAPPI Sect.* 274-278 (May 24, 1928).

Imports of Paper and Paper Making Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

Effective September 30, 1939, under Treasury Decision 49,970, all publications, exchanges and trade associations, were denied access to import manifests at the New York Customs House. The Paper Trade Journal and other interested parties have vigorously protested this ruling, and as soon as the order of the Treasury Department is modified or rescinded, full publication of all manifests will be resumed in these columns. In the interim, the Paper Trade Journal is making every possible effort to gather all available information from manifests, at various outside sources.

NEW YORK IMPORTS

WEEK ENDING JUNE 15, 1940

SUMMARY

Newsprint .....7,417 rolls
Printing paper .....16 cs.
Tissue paper .....39 cs.
Surface coated paper .....186 cs.
Surface baryta coated paper.....61 cs.
Cardboards .....2 cs.
Miscellaneous paper .....24 cs.

NEWSPRINT

H. G. Craig Co., Inc., ———Donnacona, 316 rolls.
Internaitonal Paper Co., ———, Gatineau, 280 rolls.
H. G. Craig Co., Inc., ———, Donnacona, 317 rolls.
———, ———, Comeau Bay, 6,186 rolls.
H. G. Craig Co., Inc., ———, Donnacona, 318 rolls.

PRINTING PAPER

——, ———, Antwerp, 16 cs.

TISSUE PAPER

Van Oppen & Co., Excambion, Genoa, 39 cs.

SURFACE COATED PAPER

Gevaert Co., of America, ———, Antwerp, 186 cs.

SURFACE BARYTA COATED PAPER

P. Puttmann, ———, Antwerp, 61 cs.

CARDBOARDS

A. Rosenbaum, *Belvedere,* Trieste, 2 cs.

MISCELLANEOUS PAPER

Filtrator Coffee Apparatus Co., Inc., ———, Kobe, 24 cs.

RAGS, BAGGINGS, ETC.

———, *Uruguay,* Montevideo, 8 bls. new rags.
A. W. Fenton, Inc., *Uruguay,* Buenos Aires, 16 bls. rags.
———, ———, Rotterdam, 11 bls. rags.
———, ———, *Antwerp,* 30 bls. old bagging.

CASEIN

American Cyanamid & Chemical Corp., *Uruguay,* Buenos Aires, 834 bags.
———, *Uruguay,* Buenos Aires, 834 bags.
Imes Trading Corp., *Uruguay,* Buenos Aires, 15 bags.
A. Hurst & Co., *Uruguay,* Buenos Aires, 1,735 bags.
Tupman Thurlow Co., Inc., *Uruguay,* Buenos Aires, 1,667 bags.
Packing Products Co., *Uruguay,* Buenos Aires, 634 bags.
Chemical National Bank, *Uruguay,* Buenos Aires, 417 bags.
Balfour Guthrie & Co., *Mormacrey,* Buenos Aires, 834 bags.

Bid for Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 19, 1940—Paper Corporation of U. S. has been awarded the contract for furnishing the Government Printing Office with 24,000 pounds (150,000 sheets) of 25 x 38 M.F. book paper at 5.49 cents, bids for which were received on May 22.

The same company will also furnish 10,000 pounds (25,000 sheets) of 22½ x 28½ manila cardboard at 4.75 cents, bids for which were received on May 17.

The Printing Office received the following bids for 17,550 pounds (60,000 sheets) of 50 per cent rag, double coated book paper; various sizes; Stanford Paper Company, 14.25 cents; Old Dominion Paper Company, 14.947 cents; Barton, Duer & Koch Paper Company, 13.88 cents; and Mathers-Lamm Paper Company, 14.6 cents.

For 8,150 pounds (50,000 sheets) of 100 per cent rag, 28 x 34 white ledger paper; Barton, Duer & Koch Paper Company, 19.95 cents; R. P. Andrews Paper Company, 24.93 cents; Stanford Paper Company, 20.6 cents; Old Dominion Paper Company, 19.73 cents; and Paper Corp. of U. S., 18.62 cents.

For 40,000 pounds of yellow sulphite writing paper in 32 inch rolls; Whitaker Paper Company, 6.19 cents; Mudge Paper Company, 5.78 cents; R. P. Andrews Paper Company, 6.2 cents; Barton, Duer & Koch Paper Company, 6.7 cents; Stanford Paper Company, 7.5 cents; Old Dominion Paper Company, 5.794 cents; Cauthorne Paper Company, 6.218 cents; Graham Paper Company, 6.58 cents; and Marquette Paper Company, 6.125 cents.

Now Fernstrom Paper Mills, Inc.

The California Fruit Wrapping Mills, Inc., Pomona, Cal., has changed its name to the Fernstrom Paper Mills, Inc. The reason for this change is that the company felt that the former name did not fully identify the fact that its business was a paper mill.

The company was started by Erik Fernstrom and F. O. Fernstrom about fifteen years ago, chiefly for the purpose of manufacturing tissue papers converted into fruit wrappers for domestic use and for export. During the ensuing years the company expanded its activities considerably, and it now manufactures many kinds of tissue papers and waxing papers, besides the fruit wrappers. The company has enjoyed a sound and rapid growth since it was founded, due probably to the quality of product it always aims to manufacture.

Eastern Corp. Appoints Wichita Agent

The Eastern Corporation, Bangor, Me., announces that the Southwest Paper Company has been appointed as its merchant agent in Wichita, Kans., effective June 10, 1940.

110 Firms in Paper Trade Give to Greater New York Fund

In the latest list of contributions to the Greater New York Fund, 110 concerns in the paper industry are included. Many of the firms listed do not have headquarters in New York but maintain branch offices there. Under the leadership of Roy K. Ferguson, of the St. Regis Paper Company, firms with head offices elsewhere gave generously, recognizing that all concerns doing business in New York had a common stake in helping the 393 agencies affiliated with the Fund.

Keeping New York a Good Place To Do Business

"By their gifts," said Mr. Ferguson, "they are helping to keep New York a good place in which to do business."

W. J. Dixon was given credit by Mr. Ferguson for his good work on behalf of the drive in the paper industry and for most of the result achieved. Mr. Dixon reported that the $18,414 announced by the fund is to be regarded as partial contribution and that much more will be added before the close of the drive.

List of Firms Contributing

Firms listed in the fund report were as follows:

International Paper Company and Subsidiaries, $7,500.; West Virginia Pulp and Paper Company, $1,000.; Stein, Hall & Co., Inc., $1,000.; Gottesman and Co., Inc., $1,000.; Robert Gair Company, Inc., $615.; Gilman Paper Company, $500.; Lily-Tulip Cup Corporation, $500.; Perkins-Goodwin Company, $500.; St. Regis Paper Company and Subsidiaries, $500.; Arkell Safety Bag Company and Employees, $306.05; Kimberly-Clark Corporation and Subsidiaries, $250.; Union Bag and Paper Corporation, $250.; Price and Pierce, Ltd., $250.; J. Anderson and Company, $250.

New York and Penn Company, $235.; Grand-City Container Corporation, $200.; The Mead Sales Company, Inc., $200.; Union Bag and Paper Corporation, (Additional) $200.; Forest Paper Company, Inc. and Employees, $151.; Castle and Overton, Inc., $125.; the Butterfield-Barry Company, Inc., $100.; Miller and Wright Paper Company, $100.; M. Reeve Angel and Company, Inc., $100.; Chase Bag Company, $100.; Oxford Paper Company, $100.; Johaneson, Wales & Sparre, Inc., and Cellulose Sales Company, $100.; Spear Box Company, Inc., $100.; Trinity Bag and Paper Company, Inc., $100.; Reliance Paper and Twine Corporation, $100.

Stewart, Warren and Benson Corporation and Employees, $100.; Brooklyn Standard Bag Corporation, $100.; Robinson Tag and Label Company and Employees, $80.; Fraser Industries, Inc., $75.; Midwood Paper Company, $50.; Harry Elish Paper Company, $50.; Schlosser Paper Corporation, $50.; Lathrop Paper Company, Inc., $50.; Canfield Paper Company, $50.; Charles F. Hubbs and Company, $50.; Milton Paper Company, Inc., $50.; Acme Folding Box Company, Inc., $50.; Kieckhefer Container Company, $50.; National Paper and Type Company, $50.; Dennison Manufacturing Company, $50.; Hammermill Paper Company, $50.; Strouse Adler Company, $50.; Great Eastern Packing and Paper Stock Company, $25.; Lagerloef Trading Company, Inc., $25.; Ace Paper Company, Inc., $25.; the Wright Company, Inc., $25.; Pagel, Horton and Company, Inc., $25.

Mapes Consolidated Manufacturing Company, $25.; Tension Envelope Corporation, $25.; National Folding Box Company, $25.; Miller Paper Company, $25.; Champion Paper and Fibre Company, $25.; American Paper Exports, Inc., $25.; A. R. Melker Company, $25.; B. F. Drakenfeld and Company, Inc., $25.; the Martin Cantine Company, $25.; A. W. Pohlman Paper Company, Inc., $25.; Whitehead and Alliger Company, Inc., $25.; Williams Bauer Corporation, $25.; Stora Kopparberg Corporation, $25.; George La Monte and Son, $25.; Marquardt Company, Inc. and the Vandewater Paper Company, Inc., $25.; Daniel M. Hicks, Inc., $25.; Atterbury Brothers, Inc., $25.; Joe Salwen Paper Company, $25.

Conn. Valley Paper and Envelope Company, Inc., $25.; National Pulp and Paper Company, $25.; Pejepscot Paper Company, $25.; Aaronson Brothers, $25.; Empire Boxboard Corporation, $25.; D. Benedetto, Inc., $25.; Majestic Paper Corporation, $25.; John M. Hart Company, Inc., $20.; Acme Folding Box Company, Inc., $15.; Jacobs & MacKnight, $15.; Loumna Textile By-Products, Inc., $12.; W. C. Hamilton and Sons, $10.; Fort Orange Paper Company, $10.; Alfred Bloch and Company, $10.; W. H. S. Lloyd Company, Inc., $10.; Beekman Paper and Card Company, Inc., $10.; D. M. Bare Manufacturing Company, $10.; Crowell Corporation, $10.; M. A. Steinman and Son, $10.; the Parchment and Paper Products Company, $10.; Middlesex Products Corporation, $10.; Criterion Paper and Twine Company, $10.; J. J. Murphy Paper Company, Inc., $10.

Mid-States Gummed Paper Company, $10.; Max Spiegel and Sons Company, Inc., $10.; W. E. Myers Paper Company, $6.; Arthur Downing, $5.; Herman Scott Chalfant, Inc., $5.; John F. Post Company, Inc., $5.; Bell Stationery Company, Inc., $5.; Allied Paper Mills, Inc., $5.; F. H. Knoll, $5.; Claremont Paper Company, $5.; Fort Howard Paper Company, $5.; Sanitary Paper Supplies Corporation, $5.; Radio Center Stationery Company, Inc., $3.; United Fibre Company, $2.

Veldown to Sell Specialty

The Veldown Company, 220 East 42nd street, New York, has announced that negotiations have been completed for the sale of the company's sanitary napkin business to the International Cellucotton Products Company, distributors of the Kotex brand. The actual transfer will take place on or about October 1.

The Veldown Company, through its present personnel, will continue the manufacture and sale of cleansing and toilet tissues, including Handies and Swank.

New York Paper and Pulp Market Review

Pulp Contract Prices Now Being Revised For Third Quarter Show Substantial Advances In All Grades of Domestic and Canadian Pulp — Waste Paper Market Very Strong With No. 1 Mixed Paper Up To .45 to .47½.

Office of the PAPER TRADE JOURNAL,
Wednesday, June 19, 1940.

Improvement in consumer demand reflected in the uptrend in orders and high production in many grades of paper and paper products, is indicated in reports received from many manufacturers' representatives, jobbers, and general paper merchants this week. Sales volume in some instances is over 10 per cent higher than last year.

The index of general business activity rose to 98.8 per cent for the week ended June 8, compared with 89.9 per cent for the corresponding period last year.

Paper production of 234 mills for the week ended June 8, was estimated at 93.8 per cent, compared with 76.0 per cent for 1939, with 64.0 per cent for 1938, with 88.2 per cent for 1937 and with 79.1 per cent for the corresponding week in 1936.

Paper board production for the week ended June 8 was 77.0 per cent, compared with 66.0 per cent for 1939, with 58.0 per cent for 1938, with 82.0 per cent for 1937 and with 71.0 per cent for the like period in 1936.

The wholesale paper market is reported strong, with prices firm. In common with other consumer or non-durable goods, the trend in paper and its products is upward. Third quarter prices which go into effect July 1 are from $3 to $10 per ton higher in sulphite papers. It may be pointed out that the general industrial and trade situation is favorable. Industrial prices have now turned upward and under a broadening out of demand this uptrend with demand well maintained at a high level is expected to continue for some months.

The consumption of newsprint by domestic publishers continues to show only small gains, but production of domestic and Canadian newsprint mills for May, 1940, set a new hgh record with an output of 413,770 tons, compared with the former high mark of 400,189 tons in August, 1937. The price situation remains unchanged.

Mechanical Pulp

The market situation in mechanical pulp continues strong and prices firm. Contract prices range at from $40 to $45 per ton and trend is upward. Domestic production totaled 110,483 tons for April, 1940, compared with 98,372 tons for March; first 1940 quarter output was 292,594 tons, compared with 267,055 tons for the first 1939 quarter.

Chemical Pulp

All grades of chemical pulp continue firm, with the price trend upward, with no pulp shipments coming from Scandinavia and Europe. Domestic and Canadian bleached sulphite is currently quoted at from 3.72½ to 4.50; easy bleaching sulphite, at from 3.17½ to 3.75; strong unbleached, at from 3.17½ to 3.75. Bleached kraft pulp is currently quoted at from 4.00 to 4.50; light and strong kraft, at from 3.50 to 3.75; No. 1 kraft, at from 3.25 to 3.60; while Southern kraft pulp is offered at from 3.25 to 3.60, delivered.

Domestic production of bleached sulphite pulp for April, 1940, amounted to 129,251 tons, a gain of 394 tons over March. Unbleached sulphite totaled 70,882 tons for April, compared with 72,781 tons for March. Output of unbleached sulphate pulp for April, 1940 was 232,710 tons, compared with 220,985 tons for March. Production of bleached sulphate for the like period was 40,344 tons, compared with 38,289 tons for March.

Rags

No important change has been reported in the domestic rag market this week. The only reported change in prices was on new white No. 1 shirt cuttings, which are higher and currently quoted at from 4.60 to 4.75.

Old Rope and Bagging

The old rope market continues strong with the price situation very firm, with the trend apparently upward. Mill buying is reported fair. No important price changes have been reported this week.

Old Waste Paper

The old waste paper market continues strong, under a good demand for substantial tonnage. Prices remain unchanged on all but three grades. White ledger stock is up and currently quoted at from 2.15 to 2.25; strictly over issue news at from .60 to .65; and No. 1 mixed paper has advanced at from .45 to .47½.

Twine

No important change in the twine market has been reported at this date. Prices are firm and in common with other consumer goods, the trend in both hard and soft fiber twines appears to be headed upward.

C. R. Cosby Heads Association Executive

Charles R. Cosby, executive secretary of the Label Manufacturers National Association, has been elected president of the Trade Association Executives in New York City. Frederic R. Gamble, executive secretary of the American Association of Advertising Agencies, and Miss Helen L. Stratton, secretary-treasurer of the Packing Machinery Manufacturers Institute, were both elected vice-presidents.

George F. Quimby, secretary-treasurer of the Soft Fiber Manufacturers' Institute, was named secretary-treasurer of the organization, which is composed of 278 representatives of trade associations operating in the metropolitan area. The principal subject of discussion at the annual meeting was industrial cooperation in step with government plans for national defense.

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, June 19, 1940.

BLANC FIXE—Quotations on blanc fixe are firm and conform to prevailing market quotations. The pulp is currently quoted at $35 per ton, in barrels, at works; the powder is quoted at $50 per ton, in bags, f.o.b., works.

BLEACHING POWDER—Prices on bleaching powder are reported firm. Shipments are steady for the week, with quotations unchanged. Bleaching powder is currently quoted at $2 per 100 pounds, in drums, at works.

CASEIN—Quotations on casein are reported unchanged for this week. Standard domestic casein, 20-30 mesh, is currently quoted at from 13 to 14 cents per pound; 80-100 mesh, at from 13½ to 14½ cents per pound; all prices in bags, car lots. Argentina casein is currently offered at 12 cents per pound; French casein at 15 cents per pound is nominal.

CAUSTIC SODA—Prices on caustic soda are firm and reported unchanged at prevailing market quotations. Demand moderate. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged at prevailing market levels. Domestic filler clay is currently quoted at from $7 to $15 per ton; coating clay at from $11 to $22 per ton, at mines. Imported clay is currently quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Prices on chlorine are firm and unchanged at prevailing market quotations. Demand reported moderate to good. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported firm for the week with prices lower. "G" gum rosin is currently quoted at $3.95 per 280 pounds, gross weight, in barrels, Savannah. "FF" wood rosin is currently quoted at $3.95 per 280 pounds, gross weight, in barrels, New York. Seventy per cent gum rosin size is currently quoted at $2.45 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Prices on salt cake are firm and nominal and continue unchanged at prevailing market quotations. Domestic salt cake is currently quoted at $17 per ton, in bulk; chrome salt cake at $16 per ton; all prices in car lots, f.o.b., shipping point. Imported salt cake, currently offered at $20 per ton, is nominal.

SODA ASH—Quotations on soda ash are firm and continue unchanged. Demand continues moderate. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are reported unchanged for this week. Pearl is currently quoted at $2.80 per 100 pounds; powdered starch at $2.90 per 100 pounds; all prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Shipments reported steady for the week. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at $1.60 per 100 pounds; all prices in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and continue unchanged at prevailing market quotations. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are offered at $19 per ton.

TALC—Quotations on talc are firm and conform to prevailing market levels. Domestic talc is currently quoted at from $15 to $18 per ton, Eastern mines. Imported talc is currently quoted at from $23 to $45 per ton.

MARKET QUOTATIONS

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone A			
Northern, Extra Quality	$5.25	@	$5.75
Superstandard	4.87½	"	5.25
Northern Standard Wrapping	4.37½	"	4.62½
Standard Wrapping	4.25	"	—
Tissues—Per Ream—Carlots			
White No. 1	.95	"	—
White No. 1 M. G.	.92½	"	—
White No. 1½	.77½	"	—
White No. 2	.70	"	—
Anti-Tarnish M. G.	.80	"	—
Colored	.87½	"	—
Kraft	.85	"	—
Manila	.77½	"	—
Unbl. Toilet, 1 M.	3.50	"	—
Bleached Toilet	5.26	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.00	"	—
Bleached, Jr.	3.50	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.25	@	10.25
No. 1 Manila Wrapping, 35 lb.	5.25	"	—
No. 2 Manila Wrapping, 35 lb.	5.00	"	—
Boards, per ton—			
News	35.00	@	40.00
Chip	35.00	"	40.00
Sgl. Mla. Ll. Chip	55.00	"	57.00
White Pat. Coated	67.00	"	70.00
Kraft Liners	55.00	"	—
Binders Boards	73.00	"	80.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1	$39.10 @	$46.00	$40.25 @	$47.25
100% Rag	31.05 "	36.50	32.20 "	37.75
85% Rag	.... "	....	29.90 "	35.00
75% Rag	23.60 "	27.75	24.75 "	29.00
65% Rag	.... "	....	21.65 "	26.25
50% Rag	17.55 "	21.50	18.70 "	22.75
25% Rag	14.65 "	17.75	15.80 "	19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$8.95 @	$11.00	$10.10 @	$12.25
No. 2	8.05 "	9.75	9.25 "	11.25
No. 3	7.60 "	9.25	8.50 "	10.75
No. 4	7.30 "	9.00	8.50 "	10.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$11.90	@	$13.50
No. 2 Glossy Coated	10.35	"	11.75
No. 3 Glossy Coated	9.55	"	11.00
No. 4 Glossy Coated	9.15	"	10.50
No. 1 Antique (watermarked)	8.35	"	9.50
No. 2 Offset	7.70	"	9.00
A Grade E. F.	7.50	"	8.75
A Grade S. & S. C.	7.75	"	9.00
B Grade E. F.	6.95	"	8.00
B Grade S. & S. C.	7.20	"	8.25
C Grade E. F.	6.65	"	7.75
C Grade S. & S. C.	6.90	"	8.00
D Grade E. F.	6.40	"	7.50
D Grade S. & S. C.	6.65	"	7.75

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	Nominal		
Dry	Nominal		
(Delivered)			
No. 1 Domestic and Canadian	40.00	@	45.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	3.72½	@	4.50
Prime Qualities—			
Easy-Bleaching Sulphite	3.17½	"	3.75
Strong Unbleached			
Sulphite	3.17½	"	3.75
(On Dock, Atlantic Ports)			
Kraft Bleached	4.00	"	4.50
Kraft Light & Strong	3.50	"	3.75
Kraft No. 1	3.25	"	3.60
(F. o. b. Pulp Mill)			
Kraft Domestic and Canadian	3.25	"	3.60
(Delivered)			
Soda Bleached	2.90	"	3.30

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	7.00	@	7.25
Silesias No. 1	4.60	"	4.75
New Unbleached	6.75	"	7.00
Blue Overall	4.50	"	4.75
Fancy	3.25	"	3.50
Washables	2.00	"	2.15
Mixed Khaki Cuttings	2.75	"	3.00
O. D. Khaki Cuttings	3.15	"	3.35

Old Rags

White, No. 1—			
Repacked	3.25	"	3.50
Miscellaneous	2.75	"	3.00
White, No. 2—			
Repacked	2.50	"	2.75
Miscellaneous	2.00	"	2.25
Thirds and Blues—			
Repacked	2.00	"	2.25
Miscellaneous	1.75	"	1.90
Roofing Rags—			
No. 1	1.10	"	1.15
No. 2	.82½	"	.87½
No. 3 (bagging)	.90	"	1.00
No. 4	.60	"	.65
No. 5A	.60	"	.65

Foreign Rags

All prices nominal

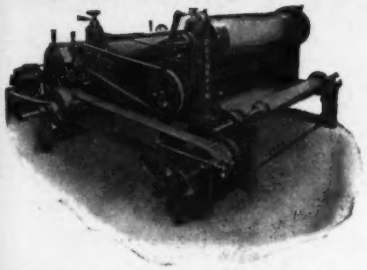
New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxford	4.00	"	4.50
New Light Prints	3.00	"	3.35

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—

For Your FINISHING ROOM...



POTDEVIN heavy duty paper waxing machine—52" wide. POTDEVIN water bath units are furnished in similar widths for combination with the waxers.

POTDEVIN *high speed*
Paper Waxing Machinery

Flexibility plus speed plus a finer product. You get all *three in one* POTDEVIN paper waxing machine. Little wonder that paper mills, whose waxing requirements are so varied, buy POTDEVIN waxers. Little wonder that the second, third and eighth waxers ordered are also POTDEVINS.

POTDEVIN MACHINE CO.
EST. 1893
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THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

DRAPER BROS. COMPANY
CANTON, MASS.

Woolen manufacturers since 1856

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★

STARCH
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AMIJEL
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LAM-O-DEX
FOR LAMINATING

COR-A-GUM
FOR CORRUGATING

For further information write

CORN PRODUCTS SALES CO.

17 BATTERY PLACE
NEW YORK CITY

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	"	4.75
No. 2 White Cotton.	3.25	"	3.75
No. 3 White Cotton.	2.50	"	3.00
No. 4 White Cotton.	1.90	"	2.20
Extra Light Prints..	2.00	"	2.40
Ord. Light Prints...	1.75	"	2.15
Med. Light Prints...	1.55	"	1.95
Dutch Blue Cottons.	2.25	"	2.50
French Blue Linens..	3.00	"	—
Checks and Blues...	2.00	"	—
Linsey Garments....	1.90	"	2.00
Dark Cottons.....	1.50	"	1.60
Old Shopperies.....	1.30	"	1.45
New Shopperies.....	1.45	"	1.50
French Blues.....	2.25	"	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.75	@	3.00
Domestic	2.50	"	2.75
Wool Tares, light...	2.00	"	2.25
Wool Tares, heavy..	2.12½	"	2.25
Bright Bagging.....	2.25	"	2.50
Manila Rope—			
Foreign	4.25	"	4.50
Domestic	3.75	"	4.00
Jute Threads.....	2.62½	"	2.75
Sisal Strings.....	2.10	"	2.35
Mixed Strings.....	1.10	"	1.20

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.10	@	3.25
Ordinary Hard White No. 1....	2.25	@	2.50
Soft White No. 1..	1.80	"	1.90
Soft White Extra..	2.50	"	2.60
Flat Stock—			
Stitchless	1.10	"	1.25
Overissue Mag....	1.00	"	1.10
Solid Flat Book...	1.05	"	1.10
Crumbled No 1			
Ledger White Stock.	2.15	"	2.25
Ledger Stock Colored	1.65	"	1.70
Manila—			
New Env. Cut....	1.70	"	1.80
New Cuttings.....	1.30	"	1.40
Old Kraft Machine Compressed bales..	1.75	"	1.85
News—			
No. 1 White News	1.75	"	1.90
Strictly Overissue.	—	"	.75
Strictly Folded....	.60	"	.65
Corrugated	.72½	"	.75
No. 1 Mixed Paper..	.45	"	.47½

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.19½	@	—
White Hemp.....	.19½	"	—
Fine Polished—			
Fine India.....	.24	"	—
Unpolished—			
Box	.15	"	—
Paper Makers.....	.15¾	"	—
Tube Rope.....	.17	"	—
Wall Paper.....	.16	"	—
Wrapping	.18¾	"	—
Soft Fiber Rope...	.16¾	"	—
Cotton	.21½	"	—

(Hard Fiber)

Medium Java.....	.20	"	—
Mex. Sisal.....	.17	"	—
Manila	.24¾	"	—
Domestic	2.25	"	2.50
Sisal Rope.....	2.25	"	2.50
Mixed Rope.....	.85	"	1.00
Transmission Rope—			
Foreign	3.50	"	3.75
Domestic	2.50	"	3.00
Soft Jute Rope.....	3.00	"	3.25
Manila Rope—			
Foreign	4.85	"	5.10
Jute Carpet Threads.	1.50	"	1.75
Gunny Bagging—			
Foreign	2.75	"	2.85
Domestic	2.50	"	3.00
Bleachery Burlap....	4.00	"	3.25
Scrap Burlap—			
Foreign	2.25	"	2.40
Domestic	2.50	"	—
Scrap Sisal.....	2.25	"	2.50
Scrap Sisal for Shredding	2.30	"	2.65
Wool Tares, Heavy..	2.40	"	2.50
New Burlap Cuttings	3.75	"	4.00
Aust. Wool Pouches.	3.00	"	3.25
Heavy baling bagging	2.60	"	2.90
Paper Mill Bagging..	1.75	"	2.00
No. 2 Bagging.....	.75	"	.80

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	—	@	.03
Fancy Percales....	.04	"	.04¼
New White No. 1.	—	"	.07½
New Light Flannelettes	.05	"	.05¼
Silesias No. 1	.05	"	—
New Black Silesias..	3.20	"	3.25
Soft Unbleached...	.07	"	.07½
Blue Cheviots.....	.05	"	.05½
Fancy	.02	"	.02½
Washable	.02	"	.02½
Cottons—According to Grades—			
Blue Overalls.....	.04½	"	.05
New Black, Soft..	.03	"	.03¼
Khaki Cuttings.....	.03	"	—
O. D. Khaki.....	.03	"	.03½
Corduroy	.02¾	"	.03
New Canvas.....	.06¼	"	.07¼
B. V. D. Cuttings...	.07	"	.07½

Domestic Rags (Old)

(F. o.b. Boston)

White No. 1—			
Repacked	2.75	"	3.75
Miscellaneous	2.40	"	2.60
White No. 2—			
Repacked	1.90	"	2.00
Miscellaneous	2.00	"	2.25
Twos and Blues.....	1.50	"	2.00
Old Blue Overalls ..	1.60	"	2.00
Thirds and Blues—			
Repacked	—	"	1.25
Miscellaneous	—	"	1.00
Black Stockings.....	3.50	"	4.00
Roofing Stock—			
No. 1.....	1.00	"	1.25
No. 2.....	—	"	1.10
No. 3.....	—	"	.90

Foreign Rags

(F. o. b. Boston)

Canvas	.04¼	@	—
Dark Cottons.....	(nominal)		
Dutch Blues.....	(nominal)		
New Checks and Blues	(nominal)		
Old Fustians.....	(nominal)		
Old Linsey Garments.	(nominal)		
New Silesias.....	(nominal)		

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f.o.b. Phila.)

Shirt Cuttings—			
New White No. 1.	.07¾	@	.07½
New White No. 2.	.04	"	.04½
Light Silesias.....	—	"	.04½
Silesias, No. 1....	—	"	.04½
Black Silesias, soft	—	"	.03¾
New Unbleached..	.05¾	"	.06
Washable, No. 1..	—	"	.04
Blue Overall.....	.04¼	"	.05
Cottons—According to grades—			
Washable No. 2...	—	"	.01¾
New Blue	—	"	.01¾
Fancy Percales....	—	"	.03
New Black Soft...	—	"	.04
New Light Seconds	.04½	"	.05
New Dark Seconds	—	"	1.55
Khaki Cuttings—			
No. 1 O. D.....	.03½	"	.03¾
No. 2 Mixed.....	.02½		.02¾
Corduroy	—	"	.03
New Canvas.....	.05¾	"	.06
New Black Mixed.	—	"	.03

Domestic Rags (Old)

White No. 1—			
Repacked	3.25	@	3.75
Miscellaneous	2.50	"	2.75
Thirds and Blues—			
Miscellaneous	1.55	"	1.65
Repacked	1.75	"	2.00
Black Stockings (Export)	3.50	"	4.00
Roofing Stock—			
Foreign No. 1....Nominal			
Domestic No. 1...	—	"	.90
Domestic No. 2...	—	"	.80
Roofing Bagging..	—	"	.70

Bagging

(f.o.b. Phila.)

Gunny, No. 1—			
Foreign .....Nominal			
Domestic	2.25	@	2.75
Manila Rope.....	—	"	4.50
Sisal Rope.....	1.75	"	2.00
Mixed Rope.....	.75	"	1.00
Scrap—			
No. 1.....	2.50	"	2.75
No. 2.....	1.10	"	1.15
Wool Tares, heavy..	3.50	"	3.70
No. 1 New Light Burlap	3.00	"	3.50
New Burlap Cuttings	2.00	"	2.25

Old Papers

(f.o.b. Phila.)

Shavings—			
No. 1 Hard White	2.50	@	2.55
No. 2 Hard White	2.10	"	2.15
No. 1 Soft White	2.00	"	2.10
No. 2 Soft White	1.60	"	1.75
No. 1 Mixed.....	.90	"	1.00
Solid Ledger Stock..	1.75	"	1.80
Ledger Stock, white.	1.90	"	2.00
Ledger Stock, colored	1.40	"	1.45
No. 1 Books, heavy..	1.10	"	1.15
Manila Cuttings.....	1.90	"	1.95
Print Manila.....	.65	"	.70
Container Manila....	.55	"	.60
Kraft Paper.....	1.70	"	1.75
No. 1 Mixed Paper..	.40	"	.45
Straw Board Chip...	.40	"	.45
Binders Board Chip..	.40	"	.45
Corrugated Board....	.70	"	.75
Overissue News.....	.75	"	.80
Old Newspapers.....	.55	"	.60

BOSTON

Old Papers

(f.o.b. Boston)

Shavings—			
No. 1 Hard White	2.75	@	3.15
No. 1 Soft White	2.00	"	2.25
No. 2 Mixed.....	.75	"	.80
Solid Ledger Books..	1.50	"	1.75
Overissue Ledger Stock	1.75	"	2.00
Mixed Ledgers.....	.85	"	.90
No. 1 Books, heavy..	1.00	"	1.10
No. 1 Books, light..	.65	"	.75
Crumpled Stitchless Book Stock.....	.55	"	.65
Manila Env. Cuttings	1.85	"	2.00
Manila Envelope Cuttings, extra quality	2.35	"	2.60
White Blank News..	1.40	@	1.50
No. 1 Kraft.....	1.40	@	1.50
Extra No. 1 Kraft...	1.60	"	1.90
Mixed Papers.....	.22½	"	.25
Print Manila.....	.50	"	.55
Container Manila...	.60	"	.70
Old Newspapers.....	.45	"	.50
Paper Wool Strings..	.90	"	1.10
Overissue News.....	1.00	"	1.10
Box Board Chips....	.40	"	.45
Corrugated Boxes....	.50	"	.55
Kraft corrugated boxes	1.20	"	1.40
New Kraft Cuttings.	2.00	"	2.25
Screening Wrappers	.60	"	.70

Bagging

(f.o.b. Boston)

Gunny Bagging—			
Foreign .....(nominal)			

CHICAGO

Waste Paper

(f.o.b. Chicago)

Shavings—			
No. 1 White Envelope cuttings..	3.00	@	—
No. 1 Hard White	2.35	"	2.50
No. 1 Soft White.	1.85	"	1.95
Ledger and Writings	.85	"	.95
Solid Books.....	.95	"	1.05
Blanks	1.50	"	1.60
Krafts	1.15	"	1.35
New Kraft Cuts.....	1.40	"	1.55
Overissue News.....	.90	"	1.10
Old Newspapers—			
No. 1 Folded News	.65	"	.75
No. 1 Mixed Paper	.40	"	.55
Roofing Stocks—			
No. 1.....	.95	@	1.00
No. 2.....	.85	"	.90

TO MANAGE TWO MILLS

(Continued from page 8)

at the bride's home by her father, the Rev. C. M. Kilpatrick. Mr. Doerfler also teaches French at the high school at Kimberly, where the couple will reside.

Kimberly-Clark Office Workers at Ball

Office employees of the Kimberly-Clark Corporation, Neenah, Wis., held their annual June ball last week at the North Shore Golf Club. Approximately 150 couples attended.

Frank Whiting Has New Speed Boat

Frank B. Whiting, president of the George A. Whiting Paper Company, Menasha, Wis., and the Whiting-Plover Paper Company, Stevens Point, Wis., has extended his boating enthusiasm to a new craft especially designed for him by Gar Wood, famous speedboat manufacturer. The boat will be capable of a speed of fifty miles per hour. Mr. Wood plans to visit Mr. Whiting in about two weeks, arriving in his amphibian plane, and will be honored at a dinner party at the North Shore Golf Club, to which 75 yachtsmen from the Fox River Valley will be invited. Many members of the paper mill fraternity are among the boating enthusiasts.

Nekoosa-Edwards Sponsors Boys Club

Nekoosa-Edwards Paper Company is sponsoring formation of a Cub pack among boys of Port Edwards and Nekoosa, Wis.